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NO. 3

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Achievement Scales in Physical Education Activities for Boys and Girls in Elementary and Junior High Schools

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NEED FOR ACHIEVEMENT SCALES

THE MEASUREMENT of achievement in physical education activities is essential to an efficient program of instruction. Briefly, there is need for a series of scientifically determined achievement scales to serve the following purposes: (a) to stimulate pupils to have an interest in all-round physical development; (b) to interest pupils in their play through a fair evaluation of their efforts; (c) to supplement the routine physical examination by finding pupils' strengths, weaknesses, and skill status so an activity program can be adapted to their needs; (d) to measure pupils' improvement in skills; and (e) to aid in further research and experimentation in the physical education field.

Many attempts have been made during the last few years to devise scoring tables (achievement scales) for various types of individual athletic events. Height, age, grade, or weight, or some combination of these factors, have been most used as a means of pupil classification. The chief criticism of most scoring tables in physical education is that they have been constructed arbitrarily or without regard to what the pupils can really do. Scores given for performances in different activities have been added without reducing them to a common denominator or using the same type of unit of measurement.

CLASSIFICATION OF PUPILS

The greatest obstacle to the construction of achievement scales in physical education activities has been the absence of any general agreement on the method of pupil classification which guarantees fairness in

the evaluation of performance. The whole field of achievement testing in physical education activities has awaited the validation of such a classification scheme.

It is conceded that there are many factors which influence the performance of boys and girls in physical education activities. Each contestant is either favored or handicapped by important hereditary and environmental factors. Differences exist with respect to native ability, structure, function, glandular secretions, state of nutrition, and the extent of previous training, experience, or practice in the activity in question. A list of the advantage and handicapping factors influencing performance in physical education activities would undoubtedly include such items as race, sex, chronological age, physiological age, grade in school, intelligence, weight, height, length of trunk, length of arms, length of legs, width of shoulders, width of hips, depth of chest, chest expansion, vital capacity, blood pressure, pulse rate, muscle tonus, nerve force, neuromuscular coordination, reaction time, strength, energy, speed, endurance, agility, courage, attitude, determination, interest, and experience. These factors are, of course, not mutually exclusive.

For fairness in competition, the differences in the general physical capacities of the contestants should be equalized by a classification scheme. If all of the causal factors related to performance were equalized between contestants, the achievements of contestants would be equal. This observation leads us to believe that only those causal factors which determine capacity, and which the individual cannot quickly and wilfully modify, should be used in the construction of a classification plan. The prevalent assumption is that bodily structure basically determines physical capacity and, hence, the use of elements of structure for purposes of classification is sound if the elements are causal factors.

In selecting the factors which are to be basic in our classification plan, we are for the present at least limited to those which can be quickly and conveniently measured in a practical school situation. This criterion, and the criterion that factors which can be changed rather quickly through the pupil's own decision or activity should not be used in the classification scheme, eliminates at once many of the factors which might otherwise be considered. It is entirely possible to arrange achievement scales for different races of people and for either sex, thus taking care of these two traits.

Physical maturity of people is commonly judged by their age, height, and weight. Another interesting observation is that in the many different types of tests devised, arbitrarily or through experiment, to measure physical efficiency, the age, height, and weight of the individual have been considered as factors in the situation. Age, height, and weight are constant factors in that one always has them with one, they change relatively slowly, and the individual has little or no control over them.

From every practical point of view, it appears that height, age, and weight should be used in some combination as the basic factors in a classification device. Other factors related to performance in individual athletic events will naturally play their part in determining within a class the individual differences in achievement. The final adequacy of these three factors for classification purposes is, of course, directly proportional to their amount of influence on performance in specific activities, influence over which the performer has no control. Such influence is obvious when one considers the maximum distances possible by six-year-old boys and eighteen-year-old boys in the standing broad jump.

CLASSIFICATION CHART AND ITS VALIDITY

The writers have established the validity of the classification chart shown here through a research¹ which resulted in finding a correlation of .983 between this plan and another set up scientifically. The scientific classification scheme was based on the relative contributions which the factors age, height, and weight make to performance in a number of achievement tests listed under four fundamental play elements. The best weightings were found to be: $A \text{ (months)} + 3.3H \text{ (inches)} + .66W \text{ (pounds)}$, or, when transposed into McCloy's terms, $20A \text{ (years)} + 5.5H \text{ (inches)} + 1.10W \text{ (pounds)}$. The classification chart was, therefore, used as the basis for the construction of achievement scales. With the height of the pupil taken to the nearest inch, the weight taken to the nearest pound, and the age found to the nearest month by means of an age chart constructed for the month, the teacher is in a position to classify her pupils by using the classification chart.

SECURING DATA

Soon after the publication of the book, *Physical Education for Elementary Schools*, by Neilson and Van Hagen,² the writers became interested in building a new testing program similar to the California decathlon program in objectives but different in technical construction. A review of the above named volume indicated there were more than sixty activities of the individual athletic event type listed for grades five, six, seven, and eight, for which scientifically constructed achievement scales could be arranged. After further study of these activities, the decision was made to reduce the list to thirty-three activities for boys and twenty activities for girls. (See Table I for names of events.)

Before making arrangements with several California school systems to have the tests given to pupils in grades five, six, seven, eight, and nine,

¹ F. W. Cozens and N. P. Neilson, "Age, Height, and Weight as Factors in the Classification of Elementary School Children." *Journal of Health and Physical Education*, III: 10, (December, 1932), 21.

² N. P. Neilson and Winifred Van Hagen, *Physical Education for Elementary Schools*. New York: A. S. Barnes and Company, 1932.

CLASSIFICATION CHART
Boys and Girls

Exponent	Height	Age	Weight	Exponent	Sum of Exponents
1	50— 51	10— 10-5	60— 65	1	9 and below A
2	52— 53	10-6 10-11	66— 70	2	
3		11— 11-5	71— 75	3	
4	54— 55	11-6 11-11	76— 80	4	10-14 B
5		12— 12-5	81— 85	5	
6	56— 57	12-6 12-11	86— 90	6	15-19 C
7		13— 13-5	91— 95	7	
8	58— 59	13-6 13-11	96— 100	8	20-24 D
9		14— 14-5	101— 105	9	
10	60— 61	14-6 14-11	106— 110	10	25-29 E
11		15— 15-5	111— 115	11	
12	62— 63	15-6 15-11	116— 120	12	30-34 F
13		16— 16-5	121— 125	13	
14	64— 65	16-6 16-11	126— 130	14	35-38 G
15	66— 67	17— 17-5	131— 133	15	
16	68	17-6 17-11	134— 136	16	39 and above H
17	69 and over	18 and over	137 and over	17	

Boys and girls in grades 5, 6, 7, 8, and 9 may be classified by using this chart.
 For example:

The height of pupil "A" is 57 inches—exponent for height is..... 6

The age of pupil "A" is 13 years and 2 months—exponent for age is 7

The weight of pupil "A" is 102 pounds—exponent for weight is..... 9

Sum of exponents 22

Pupil is in Class D.

it was necessary to prepare a set of materials. These materials included a statement concerning the purpose of the project, a list of the events, general instructions on testing, and the description and testing procedure for each of the thirty-three events selected. The description and testing procedure to be used in giving each of the tests in the future are, therefore, identical with the description and testing procedure for each event used in the collection of data from which the achievement scales were arranged.

White record sheets for boys, pink record sheets for girls, instructional booklets, descriptions of the events, and testing procedures for the events were furnished to those who gave the tests. The record sheets contained blanks in which were written the name of the school, the city, name and number of athletic event, and the month in which the tests were given. In table form, and opposite the name of each pupil, were written his date of birth, grade in school, height, age, weight, classification, first trial record, second trial record, third trial record, and best trial record. Instructions were given to leave the age, classification, and the best trial columns blank so the writers could fill in these columns and thus save those who gave the tests a considerable amount of work. Data for pupils in grades five and six were secured by supervisors assisted by teachers in the elementary schools, and data for pupils in grades seven, eight, and nine were secured by physical education teachers in junior high schools. All records were taken between May 1, 1933, and March 1, 1934.

CONSTRUCTION OF ACHIEVEMENT SCALES

In setting up an achievement scale, the first decision to be made has to do with the range of the scale. If a T-scale (or variation) is used, the upper limit is set at five sigma above the mean and the lower limit at five sigma below the mean. In this case, practically all of the scores fall between twenty and eighty, which makes both the upper and lower ends of the scale valueless. It has been shown that it is more difficult to make better time or distance as the upper ranges of performance are reached. If this be true with all types of events, we should have an "increased increment" type of scale where an increasingly larger score is awarded performances as the limit of human possibility is reached. There is, however, one fallacious assumption in this type of reasoning. We never know at what point each individual has reached the limit of his possibilities, and in order to make the "increased increment" type of scale thoroughly representative, we should construct a scale for each individual with his top score denoting the limit of his possibilities in the particular event in question. This, of course, is an impossible situation, and, hence, we must use an "even step" interval plan until additional studies produce further light on this question.

Casting aside, then, the T-scale because practically all scores would fall between 20 and 80, we are presented with two possibilities—one, the use of a range of $2\frac{1}{2}$ standard deviations on each side of the mean, and, two, the use of a range of 3 standard deviations on each side of the

TABLE I
SHOWING TYPE OF STANDARD DEVIATION

No.	Event	Event Listed for	Type of Sigma		
			Averaged	Increasing	Decreasing
1	Ball Put.....	Boys		Boys	
2	Base Running.....	Boys & Girls	Boys & Girls		
3	Basketball Throw for Distance.	Boys & Girls	Boys & Girls		
4	Basketball Throw for Goal....	Boys & Girls		Boys & Girls	
5	Basketball Throw for Goal (Special Event).....	Boys		Boys	
6	Hobble Race.....	Boys & Girls			Boys & Girls
7	Jump and Reach.....	Boys & Girls	Boys	Girls	
8	Playground Baseball Throw for Accuracy.....	Boys & Girls		Girls	Boys
9	Playground Baseball Throw for Distance.....	Boys & Girls		Boys & Girls	
10	Potato Race.....	Boys & Girls	Girls		Boys
11	Pull-Up.....	Boys		Boys	
12	Push-Up.....	Boys		Boys	
13	Run and Catch.....	Boys & Girls	Boys		Girls
14	Run—40 Yards.....	Boys & Girls	Boys & Girls		
15	Run—50 Yards.....	Boys & Girls	Boys & Girls		
16	Run—60 Yards.....	Boys & Girls	Boys & Girls		
17	Run—75 Yards.....	Boys	Boys		
18	Running Broad Hop.....	Boys	Boys		
19	Running Broad Jump.....	Boys		Boys	
20	Running High Jump.....	Boys	Boys		
21	Soccer Dribble.....	Boys & Girls	Boys		Girls
22	Soccer Kick for Distance.....	Boys & Girls	Boys & Girls		
23	Soccer Place Kick for Accuracy.	Boys & Girls	Boys	Girls	
24	Soccer Throw-in for Distance..	Boys & Girls		Boys & Girls	
25	Standing Broad Hop.....	Boys & Girls		Boys & Girls	
26	Standing Broad Jump.....	Boys	Boys		
27	Standing Broad Step.....	Boys & Girls	Boys & Girls		
28	Standing Double Broad Jump..	Boys		Boys	
29	Standing Hop, Step, and Jump.	Boys		Boys	
30	Standing Leap and Jump.....	Boys & Girls		Boys & Girls	
31	Standing Three Hops.....	Boys & Girls	Boys	Girls	
32	Standing Triple Broad Jump..	Boys		Boys	
33	Standing Whole Hammon.....	Boys		Boys	

mean. The normal probability table shows that with a range of $2\frac{1}{2}$ sigma we exclude approximately 6 cases out of 1,000 at each end of the scale, while with a range of 3 sigma we exclude only $1\frac{1}{2}$ cases out of 1,000 at each end of the scale. With this knowledge it seems wise to choose the range at 3 sigma on each side of the mean. All scales, there-

fore, have been set up in such a manner that a score of 50 represents the performance at the mean or average, a score of 100, 3 standard deviations above the mean, and a score of 0, 3 standard deviations below the mean. Each scale has been constructed in this fashion, making a score of 66 on one scale have the same relative value as a score of 66 on any other scale. This fact means that scores in various events can be added or averaged to get the total or average achievement for individuals or groups of pupils.

For all data received from the field, pupil classifications were computed and best performance records clearly marked. The best performance records in each event, and in each class, were then tabulated in frequency distributions and means and standard deviations computed. Means were plotted on graph paper, and a best-fit line drawn to represent the best estimate of the means. In some of the events for girls, particularly those which require speed and leg drive, it was noted that the best-fit line for the means is such that the curve, instead of going steadily upward, starts back toward the mean performance of the lower classifications. This seems quite natural in view of the physiological changes which take place in the girl beginning around the ages from twelve to fifteen.

It was discovered also that in a number of the events, the standard deviation value increased as boys and girls became older, taller, and heavier. Accordingly, in the events where this fact was evident, standard deviations were plotted and a smooth curve or best-fit line was drawn through the plotted points. In some of the events the standard deviations show a decreasing tendency. Just why this should be true we are not able to say, but standard deviations were again plotted and smoothed in accordance with the technic adopted.

Table I presents a list of the events arranged in alphabetical order and the type of technic used on the standard deviations—whether averaged, increasing, or decreasing. The description, testing procedure, and achievement scales for Event No. 13, Run and Catch, and a sample individual record card are given as illustrations.

EVENT NO. 13

Run and Catch

Description.—At a distance of thirty feet from a starting line, and parallel to it, stretch a cord tightly ten feet from the ground. The cord should be at least ten feet long. At signal, the pupil runs from the starting line to a point just past the cord, tosses (toward the starting line) a regulation soccer ball (fully inflated) over the cord, catches it, and runs back to touch the starting line. Three such trips are made, finishing at the starting line. In case of failure to catch the ball, it must be secured, tossed over the cord (either direction), and caught before running is continued. The starting line and the cord should both be well away from any obstruction. The total distance run is approximately sixty yards.

Testing Procedure.—

- a) Stretch the cord ten feet above the ground.
- b) Thirty feet away mark a starting line with slacked lime.
- c) Assign a pupil to watch at the cord to make sure ball is thrown over the cord.
- d) Assign a pupil to record time made.
- e) Teacher stands at starting line with stop watch in hand.
- f) One pupil runs at a time.
- g) Pupil stands erect and back of the starting line with soccer ball in his arm.
- h) Starting signal given by teacher should be: "Get ready," "Go."
- i) On the first and second returns, the starting line must be touched with the ball. On the last return, the pupil runs across the starting line.
- j) The time elapsing from the word "Go" until the pupil crosses the starting line on the third return is the pupil's record.
- k) Time shall be taken to the nearest tenth of a second.
- l) Repeat the entire test and record both trials for each pupil. The best trial is the pupil's record.

EVENT NO. 13

Run and Catch (Boys)

Classes

Time in seconds and tenths

Score	A	B	C	D	E	F	G	H	Score
100	16.7	16.0	15.4	14.9	14.5	14.1	13.8	13.3	100
99	16.8	16.1	15.5	15.0	14.6	14.3	13.9	13.4	99
98	17.0	16.2	15.6	15.2	14.8	14.4	14.0	13.6	98
97	17.1	16.3	15.8	15.3	14.9	14.5	14.2	13.7	97
96	17.2	16.5	15.9	15.4	15.0	14.7	14.3	13.8	96
95	17.4	16.6	16.0	15.6	15.2	14.8	14.4	14.0	95
94	17.5	16.7	16.2	15.7	15.3	14.9	14.6	14.1	94
93	17.6	16.9	16.3	15.8	15.4	15.0	14.7	14.2	93
92	17.7	17.0	16.4	15.9	15.5	15.2	14.8	14.3	92
91	17.9	17.1	16.6	16.1	15.7	15.3	15.0	14.5	91
90	18.0	17.3	16.7	16.2	15.8	15.4	15.1	14.6	90
89	18.1	17.4	16.8	16.3	15.9	15.6	15.2	14.7	89
88	18.3	17.5	16.9	16.5	16.1	15.7	15.3	14.9	88
87	18.4	17.6	17.1	16.6	16.2	15.8	15.5	15.0	87
86	18.5	17.8	17.2	16.7	16.3	16.0	15.6	15.1	86
85	18.7	17.9	17.3	16.9	16.5	16.1	15.7	15.3	85
84	18.8	18.0	17.5	17.0	16.6	16.2	15.9	15.4	84
83	18.9	18.2	17.6	17.1	16.7	16.3	16.0	15.5	83
82	19.0	18.3	17.7	17.2	16.8	16.5	16.1	15.6	82
81	19.2	18.4	17.9	17.4	17.0	16.6	16.3	15.8	81
80	19.3	18.6	18.0	17.5	17.1	16.7	16.4	15.9	80
79	19.4	18.7	18.1	17.6	17.2	16.9	16.5	16.0	79
78	19.6	18.8	18.2	17.8	17.4	17.0	16.6	16.2	78
77	19.7	18.9	18.4	17.9	17.5	17.1	16.8	16.3	77
76	19.8	19.1	18.5	18.0	17.6	17.3	16.9	16.4	76

ACHIEVEMENT SCALES FOR BOYS AND GIRLS

11

Score	A	B	C	D	E	F	G	H	Score
75	20.0	19.2	18.6	18.2	17.8	17.4	17.0	16.6	75
74	20.1	19.3	18.8	18.3	17.9	17.5	17.2	16.7	74
73	20.2	19.5	18.9	18.4	18.0	17.6	17.3	16.8	73
72	20.3	19.6	19.0	18.5	18.1	17.8	17.4	16.9	72
71	20.5	19.7	19.2	18.7	18.3	17.9	17.6	17.1	71
70	20.6	19.9	19.3	18.8	18.4	18.0	17.7	17.2	70
69	20.7	20.0	19.4	18.9	18.5	18.2	17.8	17.3	69
68	20.9	20.1	19.5	19.1	18.7	18.3	17.9	17.5	68
67	21.0	20.2	19.7	19.2	18.8	18.4	18.1	17.6	67
66	21.1	20.4	19.8	19.3	18.9	18.6	18.2	17.7	66
65	21.3	20.5	19.9	19.5	19.1	18.7	18.3	17.9	65
64	21.4	20.6	20.1	19.6	19.2	18.8	18.5	18.0	64
63	21.5	20.8	20.2	19.7	19.3	18.9	18.6	18.1	63
62	21.6	20.9	20.3	19.8	19.4	19.1	18.7	18.2	62
61	21.8	21.0	20.5	20.0	19.6	19.2	18.9	18.4	61
60	21.9	21.2	20.6	20.1	19.7	19.3	19.0	18.5	60
59	22.0	21.3	20.7	20.2	19.8	19.5	19.1	18.6	59
58	22.2	21.4	20.8	20.4	20.0	19.6	19.2	18.8	58
57	22.3	21.5	21.0	20.5	20.1	19.7	19.4	18.9	57
56	22.4	21.7	21.1	20.6	20.2	19.9	19.5	19.0	56
55	22.6	21.8	21.2	20.8	20.4	20.0	19.6	19.2	55
54	22.7	21.9	21.4	20.9	20.5	20.1	19.8	19.3	54
53	22.8	22.1	21.5	21.0	20.6	20.2	19.9	19.4	53
52	22.9	22.2	21.6	21.1	20.7	20.4	20.0	19.5	52
51	23.1	22.3	21.8	21.3	20.9	20.5	20.2	19.7	51
50	23.2	22.5	21.9	21.4	21.0	20.6	20.3	19.8	50
49	23.3	22.6	22.0	21.5	21.1	20.8	20.4	19.9	49
48	23.5	22.7	22.1	21.7	21.3	20.9	20.5	20.1	48
47	23.6	22.8	22.3	21.8	21.4	21.0	20.7	20.2	47
46	23.7	23.0	22.4	21.9	21.5	21.2	20.8	20.3	46
45	23.9	23.1	22.5	22.1	21.7	21.3	20.9	20.5	45
44	24.0	23.2	22.7	22.2	21.8	21.4	21.1	20.6	44
43	24.1	23.4	22.8	22.3	21.9	21.5	21.2	20.7	43
42	24.2	23.5	22.9	22.4	22.0	21.7	21.3	20.8	42
41	24.4	23.6	23.1	22.6	22.2	21.8	21.5	21.0	41
40	24.5	23.8	23.2	22.7	22.3	21.9	21.6	21.1	40
39	24.6	23.9	23.3	22.8	22.4	22.1	21.7	21.2	39
38	24.8	24.0	23.4	23.0	22.6	22.2	21.8	21.4	38
37	24.9	24.1	23.6	23.1	22.7	22.3	22.0	21.5	37
36	25.0	24.3	23.7	23.2	22.8	22.5	22.1	21.6	36
35	25.2	24.4	23.8	23.4	23.0	22.6	22.2	21.8	35
34	25.3	24.5	24.0	23.5	23.1	22.7	22.4	21.9	34
33	25.4	24.7	24.1	23.6	23.2	22.8	22.5	22.0	33
32	25.5	24.8	24.2	23.7	23.3	23.0	22.6	22.1	32
31	25.7	24.9	24.4	23.9	23.5	23.1	22.8	22.3	31
30	25.8	25.1	24.5	24.0	23.6	23.2	22.9	22.4	30
29	25.9	25.2	24.6	24.1	23.7	23.4	23.0	22.5	29
28	26.1	25.3	24.7	24.3	23.9	23.5	23.1	22.7	28
27	26.2	25.4	24.9	24.4	24.0	23.6	23.3	22.8	27
26	26.3	25.6	25.0	24.5	24.1	23.8	23.4	22.9	26

Score	A	B	C	D	E	F	G	H	Score
25	26.5	25.7	25.1	24.7	24.3	23.9	23.5	23.1	25
24	26.6	25.8	25.3	24.8	24.4	24.0	23.7	23.2	24
23	26.7	26.0	25.4	24.9	24.5	24.1	23.8	23.3	23
22	26.8	26.1	25.5	25.0	24.6	24.3	23.9	23.4	22
21	27.0	26.2	25.7	25.2	24.8	24.4	24.1	23.6	21
20	27.1	26.4	25.8	25.3	24.9	24.5	24.2	23.7	20
19	27.2	26.5	25.9	25.4	25.0	24.7	24.3	23.8	19
18	27.4	26.6	26.0	25.6	25.2	24.8	24.4	24.0	18
17	27.5	26.7	26.2	25.7	25.3	24.9	24.6	24.1	17
16	27.6	26.9	26.3	25.8	25.4	25.1	24.7	24.2	16
15	27.8	27.0	26.4	26.0	25.6	25.2	24.8	24.4	15
14	27.9	27.1	26.6	26.1	25.7	25.3	25.0	24.5	14
13	28.0	27.3	26.7	26.2	25.8	25.4	25.1	24.6	13
12	28.1	27.4	26.8	26.3	25.9	25.6	25.2	24.7	12
11	28.3	27.5	27.0	26.5	26.1	25.7	25.4	24.9	11
10	28.4	27.7	27.1	26.6	26.2	25.8	25.5	25.0	10
9	28.5	27.8	27.2	26.7	26.3	26.0	25.6	25.1	9
8	28.7	27.9	27.3	26.9	26.5	26.1	25.7	25.3	8
7	28.8	28.0	27.5	27.0	26.6	26.2	25.9	25.4	7
6	28.9	28.2	27.6	27.1	26.7	26.4	26.0	25.5	6
5	29.1	28.3	27.7	27.3	26.9	26.5	26.1	25.7	5
4	29.2	28.4	27.9	27.4	27.0	26.6	26.3	25.8	4
3	29.3	28.6	28.0	27.5	27.1	26.7	26.4	25.9	3
2	29.4	28.7	28.1	27.6	27.2	26.9	26.5	26.0	2
1	29.6	28.8	28.3	27.8	27.4	27.0	26.7	26.2	1

USE OF ACHIEVEMENT SCALES

The achievement scales resulting from this study may be used with a number of purposes in mind. They will assist the teacher in adapting the physical education program to pupils' needs; pupils may be grouped for instructional purposes in terms of their achievement in different events; individual pupil improvement will result because the boy or the girl can see in a concrete way how he or she is progressing; and progress will mean added interest and increased development. The teacher may use the achievement scales to assist her in grouping pupils according to skill. Pentathlon tests, decathlon tests, intramural competition, and interschool competition may be arranged.

Achievement scales objectively determined should replace scoring systems which are set up arbitrarily. The program here outlined should serve a useful purpose in stimulating pupil interest in all-round physical activity and in giving the teacher an instrument with which to evaluate objectively pupil progress in one phase of the physical education program. Construction of similar achievement scales for boys and girls in high schools and junior colleges is already well under way.

ACHIEVEMENT SCALES FOR BOYS AND GIRLS

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SAMPLE INDIVIDUAL RECORD CARD (TEMPORARY)

<i>John Williams</i>			<i>Burbank Junior High</i>
Name of Pupil			School
Record-Exp.	R	Exp.	Date of Birth..... <i>March 6, 1921</i>
Height	58	8	Grade of Pupil <i>H-7</i>
Age	13-1	7	Date of Test <i>April, 1934</i>
Weight	103	9	
Sum of Exp.	S = 24		
Class	D		

No.	Name of Event	Trials			Best Record	Score
		1	2	3		
2	Base Running	9-7	9-7	9-8	9-7	73
3	Basketball Throw for Distance	51-0	52-5	55-5	55-5	52
8	Playground Baseball Throw for Accuracy	68	72	60	72	60
9	Playground Baseball Throw for Distance	117-5	110-0	112-0	117-5	55
10	Potato Race	25-7	25-4	24-9	24-9	75
11	Pull-Up	3- $\frac{1}{4}$	4	4	4	48
13	Run and Catch	19-2	20-0	20-2	19-2	67
23	Soccer Kick for Accuracy	69	72	68	72	62
32	Standing Triple Broad Jump	17-6	17-4	18-1	18-1	57
33	Standing Whole Hammon	34-2	35-1	33-8	35-1	55
Sum of Scores						604
Average Score						60.4

Report of the A.P.E.A. Committee on Physical Examinations for Girls and Women

By GERTRUDE E. MOULTON, M.D.
Oberlin College, Oberlin, Ohio; Chairman

COMMITTEE

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Dr. Gertrude E. Moulton, Oberlin College, Oberlin, Ohio—*Chairman*

THE PROBLEM which was submitted in 1930 to the Committee on Physical Examinations for Girls and Women was one of determining, and recommending, a procedure which was designed for almost universal use in the field of physical education for women. This, obviously, meant limiting the problem from several different angles.

1. In the first place, it seemed to indicate a *minimum* examination. There has been no attempt to include in this report *all* the items that the Committee believes would be valuable if the examination were to be given by an experienced teacher who was allotted time to follow up the results of the examination. Still less have we attempted to include those items that only a *part* of the members of the Committee would like to recommend. We felt at the time of our report in Philadelphia, and still feel (since no one has challenged it), that the minimum examination (the one we are recommending) must be merely a starter—a “take-off” board—a place to jump from. A progressive teacher will go as far beyond this as her interest and ability will take her, if she has available time. On the other hand, every one teaching physical education, whether an experienced teacher or a first-year graduate, could profit by a standardized, uniform, officially approved “approach board.”

2. In the second place, this committee was to recommend a *physical* examination as differentiated from a medical. For two years we worked in close connection with the Committee on Medical Examinations for Girls and Women, the chairman of each committee acting as an advisory member of the other. The differentiation is not easy to make. There are not only borderline conditions, but there are absolutely *overlapping* conditions. It seems to us, as a group (although there are a few reservations), that physical education is a profession in itself. As such, the examination to be recommended as a *starting point* should include only those items with which the physical education profession deals in the routine of its work. There should not be included in its minimum examination the examination of those conditions intended to be referred to the medical profession. Education, physical education, and medicine advance as colleagues side by side. As a profession, physical education must, for the good of society, cooperate with medicine. As individual teachers, it is desirable that we establish cooperation with individual physicians, consulting with them and both referring cases to them, and receiving referred cases from them. But the physical education field is not officially the technician or handmaid to the medical field and we should not consider it a duty to make those technical measurements which must be referred to the medical profession for interpretation. Certainly that part of the examination which is not to be used by the teacher of physical education should not be included in our *minimum* examination. The time available for the average young teacher, alone, would seem to rule that out. The physical education teacher must proportion her time, in order to include both the education and the health sides of her program, making each contribute to the other. The real teacher is primarily an educator.

The Committee recommends that a medical examination by a competent physician be required before participation in strenuous competitive sports. There should be left for the medical examination those items which determine organic lesions or those which demand the use of expensive equipment.

We recommend that there be included in the minimum physical examination for girls and women no measurements which do not yield information useful to the teacher in carrying out her own program for the good of her students; or, in other words, that the examination deal with those conditions which the teacher can improve or correct or use as a basis for educational opportunity in the regular practice of her profession. All this implies that the teacher is expected to *do* something about those conditions found in the examination and to test her results by re-examination. The findings of the examination should be used as the basis for an educational opportunity, as a means of classification within the group, or as a comparative measure or record by which to judge progress.

We wish to repeat our recommendations as given at Philadelphia:

At any age level only those items should be contained in a physical examination which fulfill one or more of the following purposes:

1. To further, or create, interest in the students' physical welfare.
2. To provide positive information as to the present status of the individual in such measurements and conditions as can be largely controlled by exercise and hygienic rules of living. These measurements and observations should include those which are subject to change with changes in strength, health, and condition, and which are to be followed up with instruction and subsequent examination.
3. To classify students with regard to strength, endurance, and remediable defects to the end that they may be safeguarded from overdoing or referred to the proper sources for help.
4. To provide more data and information needed for research and study.

Our recommended minimum examination remains as suggested at Philadelphia, and consists of the following items:

I. HISTORY

1. Date of birth.
2. Disabling injuries such as sprains, fractures, dislocations, etc., and illnesses or operations within the last two years.
3. Menstrual history:
 - Interval—Reg., days Irreg., days Duration, days
 - Pain—Duration, hrs. days Amount: none, slight, moderate, severe.
 - Region: abdomen, back, legs, other.
 - Other symptoms: headache, depression, lassitude, fatigue, nausea, constipation.
 - Treatment—Bed: days hrs. Heat, Medicine, Exercise.
4. Elimination—Daily? Yes No Feces: hard, soft.
- Laxatives: frequently, seldom, never.

II. EXAMINATION

Age Weight Height standing

Body type: Stocky, average, slender.

Lung capacity:

Posture: profile picture, taken with a plumb line in the picture.

Inspection:

Antero-posterior (taken from side)

Bancroft straight-line test for weight distribution.

Weight: back, normal, forward

Head: erect, forward—slight, medium, marked

Shoulders: relaxed, normal, rigid, forward, high

Trunk: back, erect, forward

Spine: Dorsal curve marked, normal, slight

Lumbar curve marked, normal, flat

Chest: exaggeratedly high, normal, low

Abdomen: muscle tone—firm, relaxed

Knees: hyper extended, normal, flexed

Lateral (taken from back)

Trunk displacement laterally: L, R, none, slight, marked

Shoulder girdle: R, L, shoulder: high, low
R, L, twisted back

Scapulae: Prominence of vertebral borders: slight, moderate, marked
Prominence of inferior angles: slight, moderate, marked

Evidences of scoliosis: slight, moderate, marked

Flexibility antero-posterior: good, fair, poor

Pain: Dorsal, Lumbar, Sacroiliac.

Feet: Symptoms of weakness: pain, fatigue, burning.

Walking posture, toes straight, or out-toeing: slight, moderate, marked.

Longitudinal Arch: Pronation

Flexibility: poor, medium, good

Anterior Arch: callous—none, medium, marked

Toe extensors: normal, shortened

Signs of improper shoes and habits:

Corns, callous, deviations from straight inside line (slight, marked),
bunion, ingrowing nails, hammer toe, overlapping toes, compressed toes,
shortened tendon Achilles.

In conclusion, we would make clear our general feeling that, although we have recommended what, to us, seems should be the minimum, standard, universally adopted examination, we also would encourage, even urge and help, *every* teacher who is giving examinations to make scientific study of some of the other tests and measurements, to keep careful data, to learn to evaluate them, and to make available her findings. There is need of continuous, progressive, sequential work in this field.

There follows description of the technique recommended in giving these examinations, together with a selected bibliography and brief argument on each item.

TECHNIQUE FOR GIVING THE MINIMUM EXAMINATION TO GIRLS AND WOMEN

AGE, WEIGHT, HEIGHT

In regard to age, weight, and height, the following is recommended:

1. Use of weighing and measuring as an educational measure for the growing child, but substitute the Wood-Phelan Growth Chart for the height-weight tables now commonly used.

2. Use of weighing program to discover sudden or prolonged changes in weight as an indication of the state of health.

We do not recommend the weight-height relationship for college women and are doubtful of its value for children. The conclusion of our study seems to indicate that height is inadequate as a determinant for weight expectancy and often does more harm than good. Hip and chest measurements are more significant.

Two studies, *Physical Measures of Growth and Nutrition*, published in 1929 by the American Child Health Association, and *Determination of the Interrelation, Partial and Multiple, Between Various Anthropometric Measurements of College Women*, by Dr. Mary Boillin, published by Teachers College, Columbia University, together with a statement by

Dr. Thomas D. Wood in a letter to the Committee are largely responsible for the above conclusions.

The following statements from *Physical Measures of Growth and Nutrition* have had some weight in making these recommendations:

"Agreements between ratings of nutritional status made by physicians are too small to endorse this form of measurement." P. 16

"The items of an analytical rating scale in greatest agreement with total judgment are those dealing with amount and quality of muscle and amount and quality of subcutaneous tissue." P. 17

"The correlation of height and weight is not nearly as high as the correlation of other skeletal combinations with weight; therefore, it seems that height is insufficient skeletal information to use as a basis of weight classification. Individual differences in chest dimensions and hips are even more important as determinants of variations in weight. Being underweight for a given height is very apt to mean small chest and hip dimensions." P. 34

"The multiple of all eleven factors with weight are near unity; therefore, it seems that practically all the individual variations in weight may be assigned to measurable components. Analytic statements will show that not only is a child underweight, but just why he is underweight in terms of other physical traits." P. 35

Dr. Boillin in *Determinations of the Interrelations, Partial and Multiple, Between Various Anthropometric Measurements of College Women*, uses the following five measurements in predicting weight: height, chest depth, biacromial width, chest width, width of hips.

The following formula is used in predicting weight: 2.5014 width of hips, plus $.5245$ height, plus 4.6024 depth of chest, plus $.8954$ biacromial width, plus 2.8644 chest width, minus 209.225 equals weight in pounds. For a detailed examination these measurements are recommended and determined by the technique used by the American Child Health Association. The formula of Dr. Boillin seems the most reliable means of estimating the proper weight of an individual.

Dr. Thomas D. Wood, in a letter to the Committee, says:

"It is more than ever apparent to me that we should recognize two distinct uses of weighing; one, the professional health or medical use of this procedure, by which the weight of the individual, considered partly in comparison with height-weight tables, and partly through interpretation by such a procedure as developed by Dr. Boillin, is one factor in determining the judgment regarding the status and health of the individual. Consistent with this first use of weighing, I believe that the comparison of the weight of the individual with the average on the table should be made only by the physician or the non-medical specially trained worker, and that such comparison is on the whole more misleading than helpful if made by a growing child, or even by an intelligent adult, or by the parents and friends of such an individual.

"The second purpose of weighing is educational, since weight, particularly of the growing child, is such an interesting objective measure or index of growth. The educational use of weighing diminishes almost to the vanishing point when the individual reaches maturity."

If the five measurements of height, chest depth, biacromial width, chest width, and width of hips are used in predicting weight, the technique

recommended in taking these measurements is that described by Dr. Boillin on pages twelve and thirteen of the published study referred to in the bibliography.

BIBLIOGRAPHY

1. American Child Health Association. *Physical Measures of Growth and Nutrition*, 1929.
2. Boillin, Dr. Mary. *Determination of the Interrelation, Partial and Multiple, Between Various Anthropometric Measurements of College Women*. New York: Teachers College, Columbia University.

LUNG CAPACITY

Bovard and Cozens express the thought in their book on *Tests and Measurements* (page 80) that "We should discard no material or device which offers possibilities for measuring in physical education." In a *minimum* examination, however, only those measurements immediately valuable for the situation can be retained. Lung capacity (or vital capacity) is simple to take, and it creates interest on the part of the individual. McCloy ("Vital Capacity of Chinese Students," *Archives of Internal Medicine*, Nov., 1927) suggested a correlation between lung capacity and physical activity. The measurement of lung capacity has been made a part of the most noteworthy tests designed to measure physical efficiency in the last fifteen years. (See Wayman's *Education Through Physical Education* and Collins and Howe's article "The Measurement of Organic and Neuromuscular Skill" in the *American Physical Education Review*, Feb., 1924, pp. 64-69, and Garfield's "The Measurement of Motor Ability" in *Archives of Psychology*, No. 62, April, 1933.)

Abby Turner at the Symposium in Physical Education and Health in 1930, and Helen McKinstry in her article on "Evaluation of Qualities and Capacities Essential to Teaching Success" (*RESEARCH QUARTERLY*, IV:4, Dec. 1933, p. 5-24) apparently arrived at the conclusion that there is a correlation between lung capacity and general physical condition. Mrs. F. E. Leonard in an unpublished study notes that the girls at Oberlin who are chosen as being in the best condition for the most strenuous "all-star" games invariably have a lung capacity considerably above the average. In a minimum examination no complicated expensive tests and measurements can be given, but the Committee felt that so simple a test as lung capacity which had been adopted almost universally and had kept its place fairly consistently through the years, should be considered. It seems to have some significance as a means of arousing interest, as a possible basis, together with other findings, for classification, as a recording of present status to which future measurements can be compared, and perhaps will yield some data of some value in research.

The Committee, therefore, recommends the inclusion of this test in the minimum physical examination given to girls and women in connection with work in physical education. The vital capacity (lung capacity) should be taken two or three times and the highest reading recorded. Since most of the physiologists use cc. as the unit of measurement in

their discussions, the Committee recommends its adoption universally. No detailed description of the technique seems necessary.

POSTURE

A. ANTERO-POSTERIOR DISPLACEMENT

Bancroft Straight-Line Test for Weight Distribution.—A plumb line dropped from the tragus of the ear should pass through the middle of the shoulder joint, middle of great trochanter, immediately back of patella, and immediately in front of outer malleolus.

Weight: back, normal, forward.

If the greater part of the body is behind the plumb line (above mentioned), or if the plumb line falls at the back of the outer malleolus, the weight is back.

If the greater part of the body is in front of the plumb line (above mentioned), or if the plumb line falls through the front of the foot, the weight is forward.

Head: erect, forward—slight, medium, marked.

If the main axis of the neck makes an angle of 5° to 15° with the plumb line, head is *slightly* forward.

If the angle is 16° – 29° , head is *medium* forward.

If this angle is 30° or over, head is *marked* forward.

Note: These angles are to be estimated.

Shoulders: forward, normal, back, rigid, high.

If the mid-point of the shoulders is in front of the plumb line, the shoulders are said to be forward.

If the shoulders are forced back as in the military attention position, they are said to be back.

If the shoulders are elevated somewhat like a "shrugged" position, they are said to be high.

If any of the above positions are fixed so that the normal position cannot be assumed, they are said to be rigid.

In the normal position, the shoulders are low and relaxed with the shoulder blades lying against the back because the chest is held high, rather than held there because of contraction in the shoulder girdle muscles.

Trunk: backward, erect, forward.

If the trunk is in line with the plumb line, it is said to be erect.

If the trunk inclines backward from the hips so that the shoulders overhang the pelvis, the trunk is back. (This is sometimes called the "sway back" position.)

If the trunk inclines forward from the hips, the trunk is forward. This will very rarely occur.

Spine: To make a judgment about the spinal curves, the subject must be seen somewhat from the rear so that the spinal curve will not be obscured by the scapulae in the dorsal region.

Dorsal Curve: marked, normal (decreased, flat or slight).

If the spinous processes form a convex curve backwards, the posture is faulty. If the convexity is slight, the dorsal curve is slight. If the convexity is great, the dorsal curve is marked.

Opinions as to the normal curve differ. Skarstrom (p. 93) says: "The thoracic curve is moderate, long, and even." Phelps and Kiphuth (p. 91) say: "A string stretched from the first dorsal vertebra to the fifth lumbar vertebra should be straight in the antero-posterior plane . . . it should just make contact with all the spinous processes from the first dorsal vertebra to the fifth lumbar."

If Skarstrom's description is followed, the straight thoracic curve is called flat.

If Phelps and Kiphuth are followed, when the spinous processes form a concave curve backward, the dorsal curve is said to be decreased.

N.B.: Some observers will wish to add to an observation as to the rigidity of the dorsal curve. If it does not disappear in the prone position or in hanging, it is said to be rigid.

Lumbar Curve: marked, normal, flat, or reversed.

If the spinous processes of the lumbar vertebrae form a line which is sharply concave backwards, the curve is said to be marked.

As in the dorsal region, opinions as to the normality vary here.

Skarstrom says, "The lumbar curve is low and not too sharp." According to Phelps and Kiphuth, the normal is straight.

If Skarstrom is followed, the straight lumbar curve would be called flat.

If the spinous processes form a curve which is convex backward, the curve is said to be reversed.

Chest: Exaggeratedly high, normal, low.

If the chest is held forward in a stiff position, it is said to be exaggeratedly high.

If the chest is held easily so that the most forward point is further forward than is the abdomen, the chest is said to be normal.

If the chest is caved inward and held further back than is the abdomen, the chest is said to be low.

Abdomen: muscle tone—firm, relaxed, prominent, fat.

There should be firmness in muscles of the lower abdomen below the level of the umbilicus.

Muscle tone is judged by the tension of the skin and underlying tissues over the lower abdomen. If the tension of the skin and underlying tissues is tight, resistant, the muscle tone is described as firm. If this tension is loose and bulgy, the muscle tone is said to be relaxed. The abdomen is said to be prominent if in advance of chest. Prominence may be due to subcutaneous fat.

Knees: hyper-extended, normal, flexed.

The normal position for the knees is in extension. If they are over-extended, the muscles of the calf are thrust backward and the leg from the hip to ankle appears convex backward. In this condition no more

extension is possible and the legs are said to be hyper-extended.

When the knees are flexed, this condition is reversed and there is an angle at the knee joint.

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B. POSTURE: LATERAL

Physical examinations of the back should include notations on the comparative levels of the scapulae, their forward displacement and rotations; the position and flexibility of the spinal column in the antero-posterior and lateral planes; the comparison of hip prominence and height and the symmetry or asymmetry of the trunk. Note the arm-waist angle.

Trunk Displacement Laterally.—Lateral displacement of the spinal column is that position in which the upper end of the trunk is not balanced directly above the hips. It is usually accompanied by a lateral displacement of the hips over the feet but, as it is the spine that is considered, the shifting of the spine is noted by holding a plumb line free from the body, between the eye and the seventh cervical spinous process. The cleft of the buttocks and the space between the feet should fall under this line. If the spine is laterally displaced, the plumb line will fall to one side of the cleft of the buttocks,¹ although it may fall to the space between the feet. The side and degree of displacement is noted; an arbitrary common measure of degree of displacement is the width of the examiner's finger tip or one-half inch.

Shoulder Girdle.—Shoulder level. Inasmuch as the high shoulder is rare and the relaxed or low shoulder on one side is very common and usually accompanies a lateral deviation of the spine, it is the *low* shoulder which is noted as a defect.

Spine.—Shoulder displacement forward. Children's shoulders are normally more forward than adults' because of the more lateral placement of the scapulae. If this position is retained in the adult, it is a defect. It may be bilateral or unilateral and usually accompanies an increase in the normal backward curving of the dorsal region of the spine.

Scapulae.—Rotation of the scapulae. Normally the vertebral border

¹ Instead of judging displacement by means of the suggested plumb line, it is sometimes helpful to hold the plumb line so as to erect a | from the cleft of the buttocks, and note the displacement of the trunk to the right or left of the plumb line.

of the scapulae is parallel with the spinal column lying between the second and seventh dorsal. Any marked variation of one or both scapulae from this position should be noted.

Evidences of Scoliosis.—Lateral deviation of the spinal column is its curving away from a straight line and is noted by comparing it with a straight edge. The string of the plumb line is commonly used and is stretched between the seventh cervical and fourth or fifth lumbar spinous processes and the deviations of the line of the spinous processes are noted. This is made easier if the tips of the processes are located by spots of color. (Dark red lip-stick is commonly used for this purpose as it is removed readily with cleansing cream and cotton and does not scratch or irritate the skin as many so-called skin pencils do.) The degree, position, and side to which the spine deviates are noted. If the entire spine deviates to the left to such an extent that at its maximum curve the tip of the examiner's finger can be placed between it and the straight edge, then it would be named a left total curve of one degree. If only the lumbar region, then it would be a left lumbar curve. If only in the dorsal region, it is so named and if only in the middle section, then it would be named a right or left dorso-lumbar junction curve of ? degrees. If capital letters are used to designate the sides and small letters the region, an abbreviated method of recording is had: i.e., L t 1: L 11: R d 1; R d 1 j 2: And an "S" curve would be noted thus—R d 1 L 1 2:

✓ *Flexibility—Antero-Posterior.*—In the antero-posterior plane the spine should make an even continuous curve as the subject bends forward. While there is no method of measuring the curve, any section of the spine which does not participate in the curving should be noted.

In the lateral plane the trunk should not bend forward or backward. If the subject faces and is close to a wall the purely lateral bend can be obtained. The total spine should participate in the curve and any difference in the flexibility of the sides is noted. A simple and commonly used method of measuring the extent of the bending is to have the subject reach down the side of the thigh toward the knee. A lack of flexibility is usually found in bending toward the convex side of a lateral deviation of the spine. In a compound or "S" curve, the spine usually lacks in total flexibility but bending toward the side of the lumbar convexity is usually more restricted than toward the dorsal convexity. No method of measuring these differences in flexibility has been perfected but a record may be made for comparisons by photographs or silhouetteographs with or without the square-meshed screen or background.

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FEET

Walking Posture.—The gait in walking barefooted and in the shoe usually worn should be observed for weight placement and foot angulation. Eversion² or toeing-out is best seen during walking.

Do feet show: eversion or toeing-out? (G-69; C-176);³ inversion or toeing-in? (G-75, 76.)³ (Unless the subject is a small child there will seldom be an inversion or "pigeon-toed" position.)

Do feet: point straight ahead?—normal (C-100);³ touch the heel lightly to the floor, then the outer border of the foot, and last, the toes? (The step should be light, with a strong push-off from the ball of the foot and toes.) (G-34, 78; B-188; D-32; F-207, 208.)³

Does the push-off come from the side of the big toe?

Does the taking of weight in the step cause the ankle to "rock" inward? (G-75, 78.)³

Longitudinal Arch.—The examination of the *long arch* is made with the weight on the feet. The ordinarily high arch allows the examiner's fingers to reach under the foot to the space between the third and fourth metatarsal bones. Inability to reach to this point may depend on (1) fat in the sole of the foot, (2) an actual low arch, (3) thick fingers of the examiner. A method of recording may denote extent of reach on the part of the examiner or height of navicular prominence from the floor. There should be a distinction between a real flattening of the long arch and that which accompanies pronation but for recording progress in correction either of the above methods may be used as these two conditions usually go together and are corrected together though each may be present without the other.

Pronation.—Pronation is a position of the foot in which the os calcis is tipped outward at the base and inward at the top, so that the inner malleoli approach too closely when the heels are apart. As this lowers the inner border of the foot, the long arch is nearer the floor. Various methods of determining the degree of pronation as judged from the examination

² Drew (F-231) considers "eversion" as merely "raising the outer border of the foot." We have considered it as including out-toeing.

³ See bibliography at end of this section.

of the medial aspect of the foot have been suggested. None of these seem entirely satisfactory.⁴

As the upper end of os calcis in shifting inward carries with it the talus and tibia and fibula, the weight of the body falls over the inner border of the long arch, straining and eventually weakening and flattening it. Pronation is observed by viewing the back of the heel and noting the line of tendo-Achilles and the os calcis.⁵ The central line of the tendon and the bone should be perpendicular to the floor. As the edges of the TA curve outward toward the lower end, the mid-line is observed to avoid confusion. A method of recording pronation is to measure the distance between the midline of the heels at the floor level when the malleoli are in contact. As pronation disappears, this distance becomes less. (H-691; G-72, 73; F-214.)⁶ A footprint is often helpful in examining for degree of pronation (K-394; F-216; E-71; A-101.)⁶ A foot tracing likewise gives help in this connection (G-232).⁶

In standing with the feet parallel, the knee caps (patellae) should face directly forward. Note the "gravity line" which extends "from the anterior spine of the ilium through the middle of the patella into the foot through the middle of the ankle joint, approximately through the navicular and inner cuneiform bone to a point between the first and second metatarsals" (G-72, 74; F-212).⁶

Pronation of ankle and height of longitudinal arch (G-71-75; C-98, 104).⁶

Signs of Improper Shoes and Habits.—Foot examination should include the observation of the condition of the skin regarding *corns*, *callosities*, and *infections* such as "athlete's foot," the line of the big toe, the *flexibility* of the toes or any *hallux valgus* (C-176), and the position of the anterior or *metatarsal* arch, all of the above being done without weight bearing.

1. *Corns* which are numerous but not severe are not considered as injurious to the posture of the foot as even one which is deep and painful, but all are noted—both hard (on surface) and "soft" (between toes). (F-219; J-79; F-227).⁶

2. *Callouses* which are caused by lowered anterior arches or poorly fitted shoes are considered detrimental, while a general callous from barefooted walking or dancing is not. Degree of callous is more important than number because of the effect on foot posture.

⁴ See Lowman, Colestock, and Cooper, *Corrective Physical Education for Groups*, p. 43.

Another method sometimes used is as follows: Feet together, distance between internal malleoli with heels touching or between heels with internal malleoli touching. Vertical height from floor to internal malleolus. (This method is faulty because of lack of table of established norms for different size individuals.)

⁵ Lillian Drew, *Individual Gymnastics*, p. 214 and Lowman, Colestock, and Cooper, p. 73.

⁶ See bibliography at end of this section.

3. The line of the big toe should be straight through the first metatarsal bone and proximal phalanx. Any angulation of this joint should be noted and an estimated degree given. Here an actual measurement between the edges of the nails can be made for records in correction. The heels and balls of the feet should be tight together when this measurement is taken. This outward deflection is called hallux valgus. Ingrowing toe nails (J-78) should be noted.

Anterior Arch.—The metatarsal-phalangeal joints should be very near the dorsal surface of the foot when it is relaxed and no weight is on it. The examiner may grasp the ball of the foot with the thumb on top and the tips of the fingers underneath and determine the position of these joints. If they are all near the sole of the foot and the angle is pointing downward, the arch is down. If one or two are down, they should be noted and an estimated degree recorded. The joint of the fourth toe is usually one of the first to be lowered due to the common curling of the toe with the elevation of the distal end of the first phalanx and the lowering of the proximal end dragging with it the metatarsal bone. The second toe is next in frequency.

Flexibility of Feet.—The flexibility of the toes in flexion extension and abduction or separation should be noted.

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The Interests and Participation of Boys in Voluntary Physical Education Activities*

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I. INTRODUCTION

PHYSICAL educators in the last five years have been scrutinizing the activities of their programs more than ever before, and are now making adjustments which are very definitely away from the more formal types of activities, and towards those that are both developmental and recreational. They consider it their task not only to provide wholesome activities during the school years but to assist the individual in the acquisition of satisfying skills in a number of recreational activities which can be enjoyed throughout life. They are more and more shifting their emphases to activities which individuals can plan, manage, and direct without the immediate aid of the director of physical education or a similar recreational leader.

Physical education is concerned not only with planning and directing programs for children in and out of school, but it is also studying the changing interests of participants. There are relatively few in physical education today who believe that the program should be planned and directed entirely without consideration of the interests of the participant. The tendency is to place more emphasis upon the interests of the individual and to utilize interest as one of the guides to program building. Thus physical education is becoming person-centered rather than having its focus upon the activity.

It seems obvious that if the aims of physical education, whatever they may be, can be attained as quickly and effectively through participation in activities which are in themselves interesting to the participant as they can be by participation in activities which are not particularly interesting, then to force children to participate in the uninteresting activities may result in definite harm.

The study herein discussed has been directed toward a better understanding of the interests of boys in voluntary programs of physical education activities.

* Abstract of a Master's Thesis, University of Chicago, Department of Education, 1933.

II. ORGANIZATION AND PROCEDURE

A. STATEMENT OF PROBLEMS

Briefly stated, the problems of the study are as follows:

1. What specific physical education activities do Y.M.C.A. boys ten to seventeen years of age *like* and in which do they participate?
2. What specific physical education activities and what types of activities do prepubescent, pubescent, and postpubescent boys *prefer* and in which do they participate most frequently?
3. Do stronger and heavier boys *prefer* more vigorous activities than do boys who are not so strong, or who are of a more slender body build?
4. Do boys *like* the activities which physical educators consider to be the most valuable for the all-round development of boys of specific ages?
5. What is the relationship, if any, between the activities which boys say they *like*, or *prefer*, and the activities in which they say they participate?

B. TERMS TO BE USED

1. *Interest* in physical education activities, as the term is used in the present study, is expressed by two words, *like* and *prefer*. Boys may indicate that they *like* or enjoy a large number of specific activities but when asked to rank the activities in order of *preference* do not include in their *preferred* lists all of the activities they previously indicated they *liked*. The term *prefer* then implies degrees of interest and may be said to be more discriminating than *like*.

2. *Participation*, as the term is used, indicates that the individual has taken part in the activity. The descriptive terms *most*, *much*, *little*, and *none* are used to indicate the degree of participation. It is quite clear that such terms may not mean the same to everybody and therefore are lacking in objectivity. They do indicate, however, that of the total participation, some activities are participated in more than others.

3. *Physical Maturity*.—The criterion upon which judgment regarding the physical maturity of the boy was based is as follows: *prepubescent*, no pubic or axillary hair is observed; *pubescent*, a few long, straight pubic hairs are observed; *postpubescent*, the pubic hair is bunchy or curled, and axillary hair is present.

4. *Index of Physical Strength*.—The index of physical strength which was used has been recommended by McCloy. It is based on the individual's ability to chin himself. The formula, which can be computed easily arithmetically, is as follows: total strength equals 1.77 weight plus 3.42 chins minus 46. McCloy says that "chinning alone, when scored in this way, can be used as a classifying device which seems to be as adequate as the total strength test . . . and gives with relative accuracy the strength of the individual which correlates very highly with

his total strength and is more significant than total strength as a predictor of athletic ability."^{† 1}

5. *Index of Body Build*.—The weight-height coefficient as an index of body build has been recommended by Baldwin as a "practical criterion of normal growth in robustness, and, other conditions being normal, in general nutrition."² The coefficient is secured by dividing the weight in pounds by the height in inches, (W/H).

C. MATERIALS OF THE STUDY

1. *Interest Finder*.—The questionnaire method was used in the study. The preparation of the questionnaire, or Physical Education Activity Interest Finder, was completed after a brief survey of the major activities in the department of physical education of several Young Men's Christian Associations. Sixty-seven activities were included in the interest finder, and space was provided in which other activities not included in the list could be inserted.

2. *Personnel*.—Twenty-three directors of physical education from as many Young Men's Christian Associations, located in seven states of the Central Region, assisted in the study. The boys who checked the interest finders were a random sampling of the membership of the institutions, and ranged in ages from ten to seventeen years.

D. GATHERING THE DATA

1. *Checking the Interest Finder*.—The interest finders were distributed September 10, December 12, 1932, and March 25, 1933. In checking the interest finder the boys were instructed to indicate the degree of their interests in the various activities by checking every activity they were sure they either *liked*, *disliked*, or about which they were *neutral*.

In September the boys checked the activities in which they had participated between Memorial Day and Labor Day, and this was known as their summer participation. Autumn participation was checked in December and the dates were from Labor Day to Thanksgiving Day. Winter participation was checked in March and the dates were from Thanksgiving to St. Patrick's Day.

In checking *preferences* for activities the boys were instructed to name, in order, the ten activities they liked best of all, naming the best liked one first. Likewise they were told to name, in order, the ten activities in which they took part most frequently, naming the one in which they participated most frequently first.

2. *Physical Measures*.—After checking the interest finder the boys were told how to "chin" themselves. A high horizontal bar was used (reverse grasp) for this test. The boys were encouraged to chin themselves as many times as possible.

[†] Numbers refer to the bibliography at the end of the article.

Following this test, the height to the nearest inch and the weight to the nearest pound was recorded by the observer. The boy's height was taken with his shoes off, and his weight was taken with his clothing entirely removed. This last requirement made it possible for the observer to determine the state of physical maturity of the boy, which was recorded.

E. METHOD OF TREATING THE DATA

1. *Grouping the Boys.*—The interest finders were sorted into groups according to the number which had been checked by each boy. The *experimental group* consisted of 258 boys, each of whom checked the entire set of 3 interest finders. The *control group* consisted of 537 boys, each of whom checked 1 or 2 interest finders. Following this, the degree of interest as shown in activities *liked* or *disliked*, and participation according to *much*, *little*, or *none*, were tabulated according to chronological age. Percentages were then computed for interest and participation in each activity.

The materials were then classified according to the physical maturity of the boys and *preferences* were tabulated and arranged in rank order for each maturity group. Likewise participation was tabulated and arranged in rank order.

The method used in treating the data as to physical strength and body build consisted in computing the index of physical strength and the index of body build for each boy, by use of the McCloy and Baldwin formulae. The interest finders were then sorted into four age pairs, namely, ten and eleven, twelve and thirteen, fourteen and fifteen, and sixteen-seventeen. This was necessary because of the small number of boys in each of the single age groups. The next step was to tabulate the activities *preferred* by the strongest 25 per cent, the middle 50 per cent, and the weakest 25 per cent of boys, according to the index of physical strength. Comparisons were then made between the upper and lower strength groups to discover the differences and similarities in activity *preferences*. The same procedure was followed in recording the *preferences* and making the comparisons for body build.

2. *Related Investigations.*—The results of the sections of the present study which could be compared with previous related investigations† were next examined, only one of which is presented in this abstract.

III. RESULTS OF THE STUDY

1. What specific physical education activities do Y.M.C.A. boys ten to seventeen years of age *like*, and in which do they participate?

Table I presents the thirty-five leading activities *liked* by the boys of the experimental group. This group, as has been stated, consisted of the boys who returned three interest finders, one for each season—

† Refer to items 3 to 9 of the bibliography for studies which were compared with the present study.

autumn, winter, and spring. The expressed interests are shown according to chronological age and are averages for the three seasons.

Table II presents the thirty-five leading activities participated in much at the Y.M.C.A. by the boys of the experimental group. The participation is shown according to chronological age and is the average for three seasons—summer, autumn, and winter.

TABLE I
PERCENTAGE OF BOYS TEN TO SEVENTEEN YEARS OF AGE
OF THE EXPERIMENTAL GROUP WHO SAID
THEY LIKED THE ACTIVITIES
N-258

Activity	Age and Number							
	10	11	12	13	14	15	16	17
	N-29 %	N-29 %	N-30 %	N-29 %	N-41 %	N-33 %	N-34 %	N-33 %
Basketball	58*	75	82	93	87	93	93	82
Football	78	59	80	79	76	80	75	72
Hard baseball	62	72	72	57	59	68	56	59
Soft baseball	83	86	91	92	82	90	82	93
Volleyball	46	65	76	67	62	63	60	50
Water games	64	58	74	74	73	66	74	70
Tennis	47	59	54	50	62	72	63	69
Horseshoes	66	65	48	50	60	60	49	62
Handball	53	51	45	42	37	56	37	59
Informal games	37	47	53	54	42	51	35	43
Free exercises	44	34	31	49	32	37	44	43
Tumbling	48	56	63	63	44	42	48	42
Soccer	55	68	55	61	58	56	38	54
Tag games	80	60	62	50	37	37	27	30
Running races	87	68	82	72	63	60	58	52
Broad jump	50	50	63	56	51	52	64	45
High jump	47	63	64	62	52	57	60	50
Social dancing	3	14	26	16	33	34	40	58
Hikes-picnics	68	77	74	80	81	73	76	68
Skating	84	73	76	80	69	72	79	66
Wrestling	52	49	55	60	64	54	63	52
Informal swims	57	62	67	69	63	74	72	77
Life saving	32	41	62	64	62	62	66	59
Water tag	72	61	84	82	76	71	74	71
Swimming races	74	63	81	72	65	72	69	65
Diving	84	65	82	77	65	63	67	62
Swimming strokes	60	57	75	76	61	67	67	73
Gym-floor relays	65	62	70	66	47	48	47	45
Run-track relays	88	69	84	68	54	59	58	52
Basketball relay	40	57	66	66	55	58	53	54
Boxing	46	55	50	48	37	56	53	45
Touchball	57	63	53	60	42	54	46	58
Informal athletic	25	28	43	47	37	44	48	60
Parallel bars	17	36	56	46	49	56	50	49
Shot put	17	30	32	44	39	47	39	43

* This number indicates that 58 per cent of the ten-year-old boys liked basketball. It represents a composite for three seasons.

TABLE II
ACTIVITIES PARTICIPATED IN MUCH AT THE YOUNG MEN'S
CHRISTIAN ASSOCIATION BY BOYS TEN TO SEVENTEEN
YEARS OF AGE OF THE EXPERIMENTAL GROUP
N-258

Activity	Age and Number							
	10 N-29 %	11 N-29 %	12 N-30 %	13 N-29 %	14 N-41 %	15 N-33 %	16 N-34 %	17 N-33 %
Basketball	32*	37	67	77	85	74	77	67
Football	48	51	61	59	55	48	48	29
Hard baseball	37	40	45	43	31	41	33	23
Soft baseball	51	69	63	72	63	62	53	58
Volleyball	35	36	48	36	28	27	26	28
Water games	43	29	48	46	49	57	61	48
Tennis	17	20	21	28	28	38	33	28
Horseshoes	15	24	32	29	36	36	29	23
Handball	15	12	22	20	13	17	13	19
Informal games	19	19	42	35	35	25	28	15
Free exercises	13	25	23	25	30	25	24	32
Tumbling	20	31	45	32	24	17	31	16
Soccer	20	24	29	27	20	15	10	15
Tag games	16	22	50	53	34	37	19	9
Running races	55	42	59	57	44	50	51	31
Broad jump	28	38	38	54	35	46	49	33
High jump	29	37	40	51	37	26	43	34
Social dancing	0	2	3	7	0	8	22	20
Hikes-picnics	40	34	37	55	23	17	32	15
Skating	49	50	47	44	20	29	30	12
Wrestling	10	8	21	26	24	20	20	30
Informal swims	46	43	56	49	46	59	53	60
Life saving	23	16	32	30	36	43	44	39
Water tag	49	35	65	59	65	62	53	58
Swimming races	45	36	54	47	46	52	53	52
Diving	54	43	63	54	49	54	57	42
Swimming strokes	40	34	53	53	43	53	52	39
Gym-floor relays	26	31	40	34	29	26	30	15
Running-track relay	39	40	46	31	35	35	34	17
Basketball relays	14	34	46	35	30	18	44	18
Boxing	4	12	18	24	15	13	22	29
Touchball	44	35	36	56	32	32	41	25
Informal athletic	5	15	35	37	34	43	43	32
Parallel bars	4	17	37	21	32	23	17	19
Shot put	6	14	16	17	24	24	14	32

* This number indicates that 32 per cent of the ten-year-old boys said they participated in basketball *much* at the Y.M.C.A. It is a composite for three seasons.

2. What specific physical education activities and what types of activities do prepubescent, pubescent, and postpubescent boys *prefer* and in which do they participate most frequently?

The use of a single criterion, the presence and quality of pubic and axillary hair for differentiating physical maturity, may be open to criticism but is justified as a rough classification for the purpose of showing variations of interests.

The prepubescent boys ranged in chronological ages from ten to

fourteen, the pubescents from twelve to fifteen, and the postpubescents from fourteen to seventeen.

The term *preference* as used implies degrees of interest or a limited selection of activities. Each boy listed the activity he *liked best of all*, as his first choice, and the next best as his second choice, and so on, placing in rank order the ten activities which he liked best. In the same way participation was recorded, listing the first activity as the one in which he participated most frequently.

Table III shows the twenty leading activities *preferred* by the three maturity groups, also the twenty leading activities in which they participated most frequently.

Table IV shows the *preferences* for, and the participation in, team games as compared with individual activities.

3. Do stronger and heavier boys prefer more vigorous physical education activities than do boys who are not so strong or who are of a more slender body build?

It seems to be commonly assumed that individuals who are more robust in body build or who are physically stronger tend to select physical education activities that are more vigorous, and that the slender or weaker individual selects the less vigorous activities. It is toward this assumption that the data on physical strength and body build is directed.

In Table V the activities of the interest finder have been classified into various types according to the vigorousness of the activity. Sixty-four individuals in physical education, all of whom had participated in most of the activities to some extent, assisted in establishing the values for each activity. In doing this they rated the activities according to their estimate of the strength, speed, and power needed *by the average person as he participates in the activity for 30 minutes*. The *very vigorous* activities ranged in value from 8 to 10 points; *vigorous*, from 7 to 7.9; *moderately vigorous*, 5.5 to 6.9; *light*, 3.1 to 5.4; and *very light*, 1 to 3.0. The median rating for each activity was adopted, instead of the average, as the median is less influenced by the extremes. The writer recognizes the lack of objectivity in such estimates and realizes they are subject to all of the limitations of opinion. A random division of the raters into 2 equal groups, to discover the extent of agreement between the ratings of the 2 groups, resulted in a correlation of .89, with a probable error of $\pm .02$.

Table VI indicates the rank order of *preferences* for specific activities by boys of various age pairs and quartiles of strength and body build.

4. Do boys *like* the activities which physical educators consider to be most valuable for the all-round development of boys of specific ages?

Tables VII, VIII, and IX present in rank order the activities suggested by the Committee on Curriculum Research of the Society of Directors of Physical Education in Colleges³ as being most valuable for boys ages ten to eleven, twelve to fourteen, fifteen to seventeen. The

TABLE III
PERCENTAGE OF PREFERENCES AND PARTICIPATION
ACCORDING TO PHYSICAL MATURITY
N-457

Activities	Preferences		
	Prepubescent	Pubescent	Postpubescent
	N-185 %	N-142 %	N-130 %
1. Basketball	14*	19	19
2. Hard baseball	17	16	14
3. Swimming	14	17	15
4. Football	16	13	13
5. Volleyball	6	9	5
6. Tennis	1	3	10
7. Soft baseball	4	6	4
8. Running races	5	5	3
9. Skating	5	1	4
10. Soccer	3	3	2
11. Wrestling	1	1	3
12. Handball	1	1	2
13. Diving	3	0	2
14. Golf	0	2	2
15. Horseshoes	2	0	1
16. Tumbling	2	0	1
17. Boxing	1	0	1
18. High jump	1	1	0
19. Hikes-picnics	1	0	0
20. Archery	1	0	0

Participation			
1. Basketball	19**	19	17
2. Hard baseball	14	14	14
3. Swimming	19	17	17
4. Football	13	13	15
5. Volleyball	4	8	6
6. Tennis	1	3	9
7. Soft baseball	6	4	4
8. Running races	10	5	7
9. Skating	1	4	3
10. Soccer	2	4	0
11. Tumbling	3	1	0
12. High jump	2	1	0
13. Wrestling	2	0	2
14. Hikes-picnics	0	3	0
15. Golf	1	0	2
16. Handball	0	0	3
17. Diving	1	0	0
18. Boxing	0	2	1
19. Broad jump	1	0	0
20. Informal games	1	0	0

* This number indicates that of the total preferences of prepubescents, 14 per cent were for basketball.

** This number indicates that of the total participation in activities by the prepubescents, 19 per cent was in basketball.

numbers in the "value" column are the numerical values placed on the activities by those who rated the activities for the Committee. The larger the numeral the greater the value of the activity for all-round development of boys. The activities are listed according to rank order, with the most valuable activities near the top of the column. The second column of numerals indicates the percentage of Y.M.C.A. boys of the present study who said they *liked* the activity.

Although there are many outstanding deviations of the interest column from that of the value column, the general tendency is for the percentage of boys who liked the activity to decrease as the value of the activity decreases.

GENERAL SUMMARY OF THE RESULTS, WITH SOME INTERPRETATIONS

1. With slight exceptions, the following activities are *liked* and *preferred* by the Y.M.C.A. boys, ages ten to seventeen, of this study, by prepubescent, pubescent, and postpubescent boys, and by boys of varying degrees of physical strength and body build. The activities are: basketball, hard baseball, swimming, football, volleyball, tennis, soft baseball, running races, skating, and soccer. (Tables I, II, III, VI.)

2. The increase of interest in social dancing, tennis, golf, and life saving seems to accompany the approach of physical maturity. It may possibly accompany the approach to social maturity as well. (Tables I, II, III, V.)

3. Increasing interest in life saving may be due to increasing ability to take care of one's self in the water and a desire to take care of others, e.g., one of the opposite sex. (Tables I, III, VI.)

TABLE IV
PREFERENCES AND PARTICIPATION IN TYPES OF ACTIVITIES
ACCORDING TO PHYSICAL MATURITY

Activities	Prepubescent	Pubescent	Postpubescent
	%	%	%
Team game preferences	64*	82	73
Team game participation	68	70	73
Individual activity preferences	36	18	27
Individual activity participation	32	30	27
Basketball, hard baseball, swimming, and football made up this percentage of total preferences	61	65	61
Basketball, hard baseball, swimming, and football made up this percentage of the total participation	65	62	63
Ten leading activities made up this percentage of the total preferences	85	82	89
The ten leading activities made up this percentage of the total participation	89	90	90

* This number indicates that 64 per cent of the prepubescent preferences were for team games.

TABLE V
ACTIVITIES CLASSIFIED ACCORDING TO THE STRENGTH, SPEED, AND POWER
REQUIRED BY THE AVERAGE PARTICIPANT

I. *Very Vigorous*

Wrestling	9.8*
Basketball	9.6
Soccer	9.6
Swimming race	9.6
Speedball	9.4
Boxing	9.3
Running races	9.0
Hurdles	9.0
Football	8.6
Pole vault	8.2

II. *Vigorous*

High hor. bar	7.8
Handball	7.7
Parallel bars	7.7
Life saving	7.7
Rope climbing	7.7
Shot put	7.6
Side horse	7.6
Touchball	7.5
Tumbling	7.3
Stall bars	7.1
Javelin	7.1
Discus	7.1
Rings	7.1
Squash	7.0
Water tag	7.0
Water games	7.0

III. *Moderately Vigorous*

Tennis	6.8
High jump	6.8
Broad jump	6.6
Hop-step-jump	6.6
Gymnastic dance	6.6
Medicine ball	6.2
Swim strokes	6.1
Water stunts	6.1
Free exercise	6.0
Soft baseball	5.9
Hard baseball	5.8

IV. *Light*

Run track relay	5.3
Volleyball	5.2
Low hor. bar	5.2
Skating	5.1
Badminton	5.1
Chestweights	5.1
Buck	5.0
Diving	5.0
Dumbbell drill	4.9
Wand drills	4.9
Gym floor rel.	4.6
Circle games	4.4
Tap dancing	4.0
Tag games	4.0

V. *Very Light*

Golf	3.0
Indian clubs	3.0
Hiking	3.0
Horseshoes	3.0
Archery	2.8
Social dance	1.1

* This number represents the index of strength, speed, and power needed by the average individual as he participates in the activity for thirty minutes. It is the median score of sixty-five judges.

4. Tennis and informal swimming are activities which may be carried on for recreational purposes throughout life, and it may be a recognition of these recreational values that accounts in part for the increasing interest with increasing chronological age. (Table I.)

5. Increasing interest in basketball, informal athletics, and shot put with increasing age may be accounted for by the normal increase in physical strength, and probably increasing skill. (Table I.)

6. The fluctuations in interest in tumbling, wrestling, boxing, and parallel bars at about thirteen years may be due in part to the fact that with many boys the growth in physical strength does not quite keep up with the growth in size. Thus inability to control the body in such activities, most of which require considerable strength, would undoubtedly

result in less participation though the interest remained. (Table I.)

7. Activities such as golf and tennis, in which speed and accuracy are important factors, are found to be more popular with older boys. (Tables I, VIII, IX.)

TABLE VI
RANK ORDER OF PREFERENCES FOR SPECIFIC ACTIVITIES BY BOYS OF VARIOUS LEVELS
OF STRENGTH AND BODY BUILD

Activity	Physical Strength											
	Ages 10-11			Ages 12-13			Ages 14-15			Ages 16-17		
	Q ₃	Q ₂	Q ₁	Q ₃	Q ₂	Q ₁	Q ₃	Q ₂	Q ₁	Q ₃	Q ₂	Q ₁
Swimming	1*	1*	2*	2	2	2	2	2	2	1	2	1
Basketball	3	4	4	1	1	1	1	1	1	2	1	2
Football	2	3	1	3	3	4	3	3	3	3	3	4
Hard baseball	4	2	3	4	4	3	4	4	4	7	5	3
Volleyball	10	9	7	6	5	5	10	6	6	6	6	6
Running races	5	6	5	5	8	6	6	9	8	9	9	10
Tennis				7	9	7	5	7	7	4	4	
Soft baseball		7			6			5	5	8	10	7
Skating		5		9	7	8	7	8	10			
Soccer			8		10		9	9				5
Golf				8			10		10	7	9	
Diving	6	8	10			9						
Handball										8	8	
Boxing		10	6									
Hikes-picnics			9			10	8					
Tumbling												
Wrestling										5		
High jump				10								
Archery	8											
Horseshoes	9											
Run-track relays	7											
Activity	Body Build											
Swimming	1	1	4	2	1	3	1	2	1	1	1	2
Basketball	4	4	3	1	2	1	2	1	3	2	2	1
Football	3	2	1	4	3	2	3	4	4	3	3	3
Hard baseball	2	3	2	3	4	4	4	3	2	5	4	4
Volleyball	10	7	8	6	5	5	10	5	6	10	8	5
Running races	8	6	5	5	8	6	5	9	8	7	10	9
Tennis					6	10	7	6	7	4	5	8
Soft baseball	6			7	7		9	7	5		7	6
Skating	7	5		8	9		6	8	9	6		
Soccer			6		10	9	8		10			
Golf				10						8	6	10
Handball										9	9	7
Boxing		9	9				10					
Hikes-picnics												
Tumbling		8	10			7						
Wrestling						8						
High jump				9								
Archery	9											
Horseshoes												
Run-track relays												

* This number indicates that swimming was preferred first by the strongest 25 per cent of boys ages ten-eleven, first by the middle group, and second by the weakest 25 per cent.

TABLE VII
ACTIVITIES RANKED ACCORDING TO INTEREST AND ALL-ROUND VALUE
FOR BOYS TEN AND ELEVEN YEARS OF AGE

Rank	Activity	Value	Per cent who like
1.	Swimming-diving (informal swims)	7.8	85
2.	Playgroundball (soft baseball)	6.7	86
3.	Gymnastic games (relays-inf. games)	6.6	86
4.	Modified games (tag-water games)	6.3	75
5.	Life saving	5.4	38
6.	Soccer	5.2	65
7.	Track-field (races, jumps)	5.2	65
8.	Tumbling-pyramids	4.5	61
9.	Tennis	3.9	61
10.	Volleyball	3.7	61
11.	Hard baseball	3.4	68
12.	Handball	3.0	54
13.	Horseshoes	2.8	62
14.	Free exercises	1.8	38
15.	Heavy apparatus (rings-ropes, etc.)	1.6	25
16.	Touchball	.8	62
17.	Squash	.5	15
18.	Archery	.3	15
19.	Wrestling	.2	50
20.	Boxing	.2	51
21.	Basketball	.2	71
22.	Football	.2	73

TABLE VIII
ACTIVITIES RANKED ACCORDING TO INTEREST AND ALL-ROUND VALUE
FOR BOYS TWELVE TO FOURTEEN YEARS OF AGE

Rank	Activity	Value	Per cent who like
1.	Swimming-diving (informal swims)	8.3	83
2.	Basketball	7.6	90
3.	Football	7.3	79
4.	Playgroundball (soft baseball)	7.2	86
5.	Soccer	7.2	61
6.	Volleyball	7.0	66
7.	Hard baseball	6.7	71
8.	Tennis	6.7	57
9.	Speedball	6.7	53
10.	Track-field (running-jumps)	6.7	72
11.	Modified games (water tag, tag)	6.3	73
12.	Gym games-relays (relays-informal games)	6.3	76
13.	Touch football (touchball)	6.2	58
14.	Life saving	6.2	60
15.	Wrestling	5.8	61
16.	Boxing	5.5	55
17.	Handball	5.5	52
18.	Tumbling-pyramids	5.5	59
19.	Golf	4.6	50
20.	Squash and squash tennis	4.3	35
21.	Horseshoes	3.4	55
22.	Free exercises	3.2	50
23.	Archery	3.2	25
24.	Heavy apparatus (rings, parallels etc.)	3.2	57
25.	Marching	2.8	33

TABLE IX
ACTIVITIES RANKED ACCORDING TO INTEREST AND ALL-ROUND VALUE
FOR BOYS FIFTEEN TO SEVENTEEN YEARS OLD

Rank	Activity	Value	Per cent who like
1.	Swimming-diving (informal swims, diving)	8.7	79
2.	Football	7.6	76
3.	Basketball	7.6	91
4.	Tennis	7.3	68
5.	Playgroundball (soft baseball)	7.3	93
6.	Soccer	7.3	60
7.	Speedball	7.3	45
8.	Volleyball	6.7	59
9.	Hard baseball	6.7	59
10.	Touch football (touchball)	6.6	62
11.	Life saving	6.4	62
12.	Boxing	6.4	55
13.	Gym games and relays (relays-inform.)	6.3	58
14.	Track-field (jump, running vault)	6.2	61
15.	Wrestling	6.1	58
16.	Golf	6.1	40
17.	Handball	6.1	58
18.	Modified games (tag, water games, etc.)	6.1	68
19.	Tumbling and pyramids	5.8	44
20.	Squash and squash tennis	5.6	25
21.	Archery	4.3	23
22.	Horseshoes	4.0	60
23.	Heavy apparatus (rings, bars)	3.7	60
24.	Free exercises	3.4	50
25.	Marching	2.5	23

8. Interest and participation in football, basketball, and baseball continue over a longer period of years than in soccer. It may be that the element of throwing, which is common to the first three sports and which is absent in soccer, is a determining factor. (Tables I, II.)

9. Interest in soccer is much higher among boys whose parents are of European nationalities.

10. Some activities in which interest decreases inversely with chronological age require a limited amount of skill. Tag games, circle games, and relays are undoubtedly dropped because they no longer challenge the greater skill of the older boys. (Table I.)

11. In running races the decrease of interest with increasing age may be due to a "psychology of success." In this type of activity only one person wins a race, thus a series of defeats may account for loss of interest in the activity. (Table I.)

12. Interest in skating decreases very little with increasing age but the drop in participation is pronounced. The latter may be due to seasonal changes of interest, to inadequate facilities, and to poor methods of scheduling the skating facilities. Too frequently children of all ages are using the skating facilities together, a practice that is seldom tolerated in other activities. (Tables I, II.)

13. Normally the handball facilities of the Y.M.C.A. are not available for the use of younger boys, but these boys do play modified forms of the game outdoors, using any sort of flat surface that is available. The decline of interest to about fifteen may be due to dissatisfaction with the out-of-door facilities plus the lack of indoor courts. The subsequent rise in interest at about sixteen to seventeen may be due to the fact that the indoor facilities are made available for their use at the Y.M.C.A. (Tables I, VI.)

14. The decrease in interest in free exercise with increasing age may be due to the methods of conducting the activity, and the lack of challenge as compared with games. The subsequent rise in interest from fifteen to seventeen may be due in part to a recognition of the values of free exercises to put one in "condition" for other activities. (Table I.)

15. From 61 to 65 per cent of all *preferences* and participation of the three physical maturity groups can be accounted for in four activities—basketball, hard baseball, swimming, and football. (Table IV.)

16. The pubescent boys show a greater interest in team games than do either the prepubescent or postpubescent boys. The percentages of the total preferences which were for team games are as follows: prepubescent, 64 per cent; pubescent, 82 per cent; postpubescent, 73 per cent. The percentages of total participation which were for team games are 68, 70, and 73 per cent, respectively. (Table IV.)

17. The ten activities named in paragraph one of this general summary constitute from 85 to 92 per cent of the total *preferences* and at least 85 per cent of the total participation of the three maturity groups. These results indicate a very close agreement between activity preferences and participation. (Tables I, III, IV.)

18. One of the significant findings of this study is related to the relationship between interest and participation. It will be noted in Tables I and II that interest far exceeds participation. This participation lag is not noticeable in Tables III and IV, in fact the participation, when placed in rank order, occasionally exceeds the preferences.

19. There is some evidence that the weaker 25 per cent of boys, ages ten to eleven, prefer more of the vigorous type of activities than do the strongest 25 per cent. In all other age groups the selections are about the same for each level of strength. Similarly boys ten to thirteen who are of slender body build select more activities of this type than do the more robust boys of the same ages. (Tables V, VI.)

20. Soccer, one of the most vigorous games was *preferred* by three of the four weakest groups and by only one of the four strongest groups. (Table VI.)

21. More of the *light* and *very light* activities were *preferred* by the strongest 25 per cent of boys, ages ten to eleven, than by the weakest 25 per cent. Likewise the more robust boys of ages ten to thirteen select

more of the light and very light activities than do the slender boys. (Tables V, VI.)

22. *Moderately vigorous* activities were selected about equally by all levels of strength and body build. (Tables V, VI.)

23. There is some evidence that preferences for games increase with increasing chronological age when considered by age pairs as has been done with reference to strength and body build. This is shown by the following:

a) Total game preferences by 10-11-year-old group	15
b) Total game preferences by 12-13-year-old group	18
c) Total game preferences by 14-15-year-old group	20
d) Total game preferences by 16-17-year-old group	23

24. The index of body build correlates .94 with the index of physical strength. This coefficient of correlation is high enough to indicate that the results for strength could be used to predict the result for body build, and vice versa.

25. The findings of this study indicate that boys like the activities which leaders in physical education think are most valuable for the all-round development of the boys. (Tables VII to IX.)

26. The results for the experimental group were so similar to those for the control group that for certain parts of the study the results for the former were used as a sampling of the combined groups. The findings for the same 258 boys for 3 seasons should be a more reliable indication of the changing interests of boys.

27. The term *preference* as used in this study is probably a better indication of interest than the term *like*. The number of activities said to be liked by the boys was much larger than the number of activities preferred. This implies a greater degree of selection in preferences. It would seem, then, that individuals who have the responsibility for program planning in physical education should recognize these differences, particularly if interest as such is a criterion. Ample support of this statement is found in Tables I to IV. Refer also to Paragraph 18 of this general summary.

28. If the expressed interest and participation of the Y.M.C.A. boys of this study can be used as a criterion for judging the value of the program of physical education for all-round development of boys in the twenty-three Young Men's Christian Associations studied, then the following statement may be said to be fairly accurate. With the exception of out-of-door activities, there is a close agreement between the program recommended by the Committee on Curriculum Research of the Society of Directors of Physical Education in Colleges and the program being conducted in the institutions of the present study. It should be stated at this point that only a limited number of the institutions have out-of-door space available for their programs.

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The Significance of Strength Tests in Revealing Physical Condition¹

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I

THE POSITIVE and very high relation of muscular strength to general health, physical fitness, or "capacity for activity" can hardly be questioned. With no strength there can be no physical activity; moreover, when muscular strength is low, all other life functions are handicapped. One can hardly see as much, hear as much, meet as many persons, or contribute as much to social life when one is continually fatigued by the most necessary activities of life—eating, digestion, attention to environment, and the physical movements incident upon travel from one group of surroundings to another. Physical educators are coming increasingly to recognize, therefore, that the development of muscular strength is of prime importance in any rational physical education program—though there are limits beyond which it is improper to go in the improvement of any particular individual's physical powers.

II

The relation of the effective condition of voluntary muscle tissue to other organic conditions is just beginning to be recognized; but experiences are multiplying which reveal, beyond peradventure, the truth of the following rule: *Practically every change in the condition or functioning of the vital organs has a corresponding change in the condition or functioning of voluntary muscles.*

The reasonableness—even inevitability—of this proposition will be manifest to physiologists. Philosophers, especially in physical education, may go further: if muscles could maintain their powers in the presence of organic deficiencies or diseases, the latter would be inconsequential! For it is the prime function of respiration, circulation, digestion, elimination, and even cerebration, to maintain the effectiveness of muscles as means of locomotion and manipulation. . . .

III

The corollary to the rule stated in II above—*strength tests, when scores therefrom are statistically combined in the Physical Fitness In-*

¹ For validity, reliability, and objectivity of grip strength tests see Frederick Rand Rogers, *Fundamental Administrative Measures in Physical Education*, Chapters XI and XIII, The Pleiades Co., Newton, Massachusetts.

dex,² reveal organic fitness or lack of fitness with a remarkable degree of validity—has been established objectively.

1. The correlation coefficient between medical ratings and the P.F.I. is twice as high as between teachers' judgments of intelligence and I.Q.'s.

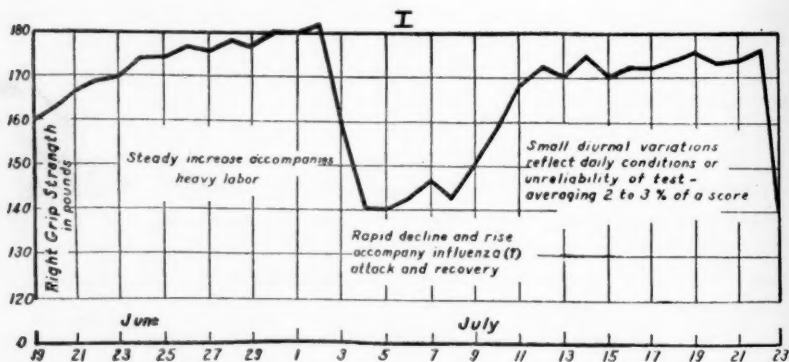
2. When doctors and P.F.I.'s have disagreed, it has often occurred that the former were in error—P.F.I.'s indicated conditions which routine medical examinations failed to discover.

3. Low P.F.I.'s have already led to the discovery, by physicians, of such "drains" as tuberculosis, badly refracted vision, poor nutrition, syringomyelia, infected tonsils, nervous debility, etc.

IV

A recent study indicates that grip strength alone responds remarkably well to changes in general physical condition. The subject was an American male, about 40 years old, whose weight during the tests varied between 182 and 188 pounds, and whose occupation is that of a business and professional executive.

Charts I, II, and III explain themselves. The subject, after being trained in testing technique, tested himself daily or oftener, and recorded the scores. These were plotted and the resulting curves interpreted. They fall naturally into eight divisions:

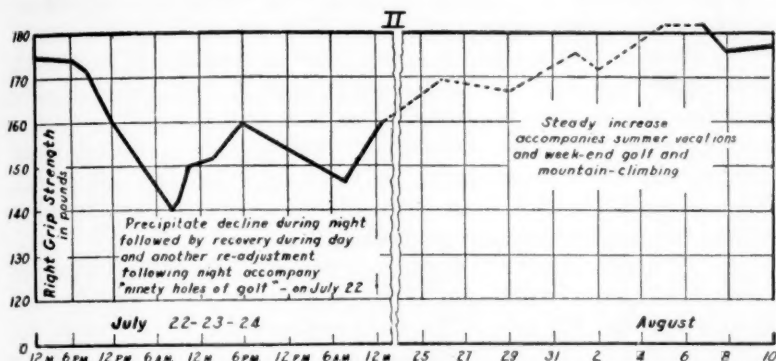


1. The first period of 13 days was one of heavy manual work, the subject amusing himself while on vacation by assisting carpenters in the construction of a boat. His grip strength improved steadily with exercise, from 160 to 182 pounds. (The first score was recorded on the first day of the vacation.)

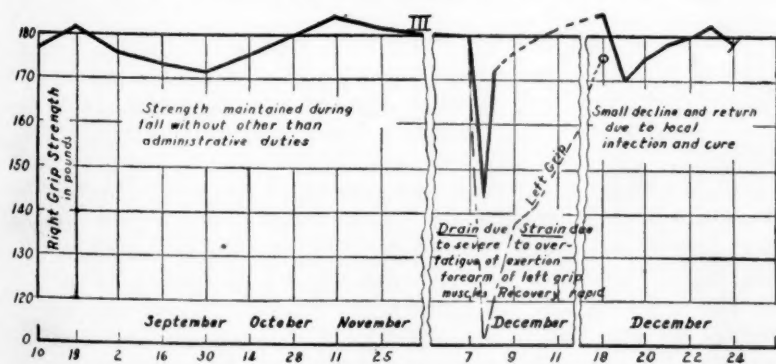
2. The second period of 9 days was one of reaction, due to a mild attack of la grippe or influenza, and recovery therefrom. It is significant to note that the subject's grip strength dropped precipitately

² The Physical Fitness Index is the Achieved Strength Index divided by a normal Strength Index for the individual's sex, weight, and age. The Strength Index is calculated from scores in seven physical capacity tests—lung capacity and the strength of right grip, left grip, back, legs, arms, and shoulder girdle groups in extension, flexion, and rotation.

before he was "aware that he was ill." What he regarded on July 3 as "unexplainable fatigue" must have coincided with the serious phase of bodily adjustment to cope with the contagion. Grip strength dropped precipitately to 140 and rose gradually in a week to 170. (The temperature increase was never over 1.5° .)



3. The fourth period of 3 days embraced an experiment in "exercise and fatigue." Ninety holes of golf were played on the twenty-second of July between 6:00 A.M. and 4:00 P.M. on a mountain course where the air was bracing. (The course was unusually level.) The subject's eighty-ninth hole was "a birdie 4 on 525 yards, slightly uphill, in the rain." After dinner the subject took his family to a barn dance returning home at midnight. It is especially interesting to note that his grip strength declined but slightly (from 175 to 172) before 8:00 P.M., that it was lower the following morning (140) than at midnight (160), that it rose during the day to 160, to decline again the following night to 147 the next morn-



Effects of exercise, la grippe, over-work, vacations, administrative duties, severe drains, strains, and laryngitis on strength of right grip measured by the manometer (1933)

ing. Physiologists can provide adequate explanations; grip strength reveals the condition.

5 and 6. The fifth and sixth periods are explained in the charts. It is of especial interest that the subject's strength remained at a very high level during September, October, and November. For he literally took no recreative exercise at all. (Average grip strength for individuals of the subject's age, weight, and *condition of servitude* is about 140.)

7. The seventh period of 4 days was induced by "a hard day's work, chiefly one of nervous strains, but accompanied by certain physical activities involving the forearms." One hand was fatigued—the score dropping from 180 to 145; the other was strained to the point of inducing pain on any severe contraction—the score dropping from 172 to 112. Note the rapid recovery of the right grip as compared with that when fatigue was greater and more general.

8. The final period of 6 days was begun when the subject requested a test "because I am a sick man." His trouble was a mild laryngitis which greatly impaired his speech. To our great surprise, his test score was higher than ever—186. The explanation was that (a) the infection was local; (b) the feeling of illness was really one of inconvenience; and (c) the subject had rested the entire day before being tested. The subsequent slight drop in strength to 170 and early return to the high level of 180 indicated quite accurately the course and intensity of the illness. (This individual has since increased his right grip strength to 190–200.)

V

The study outlined in the previous pages is reported in some detail because it indicates beautifully how responsive is effective voluntary muscle tissue to changes in physical condition. That it illustrates so many phenomena is a bit of luck—resulting from fortuitous circumstances rather than a planned program.

VI

The writer begs leave to add certain irrelevant but important data. Physical educators—and indeed educators in general—are usually unfamiliar with the criteria by which any test must be judged. Thus, the C—blood-ptosis test of circulatory fitness probably is quite worthless for physical educators, because it lacks reliability—its reliability coefficient being about .18. If those who constructed this test had taken the precaution to check its reliability, it never would have been proposed for more general use—and if experimenters had checked its reliability "before using," they would have been spared much unprofitable labor.

This and many other tests proposed to educators for general or experimental use also lack proven validity. It is significant, therefore, to report that the reliability coefficient of grip tests is comfortably above .90. Their validity as measures of capacity for physical activity has also been established. The present report should serve to increase general confidence in the high validity of strength tests as measures of general health or "capacity for activity."

The Organization of Physical and Motor Traits in Junior High School Boys

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and

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I. PURPOSE AND METHOD OF THE STUDY

THE PURPOSE of this investigation is to determine the inter-relationships among certain traits of junior high school boys. The traits studied are: (1) some of the skills involved in football, baseball, basketball, track, and field athletics; (2) height and weight; (3) chronological age; and (4) general intelligence.

The tests were made during January to April of 1932 at the West High School, Madison, Wisconsin. One hundred and fifty-five junior high school boys were examined at physical education class periods. They were in grades seven, eight, and nine and ranged in age from eleven years and four months to seventeen years and four months.

Standard playing equipment was used in administering the tests. They were conducted indoors except as otherwise noted.

BASKETBALL

1. *Accuracy Pass*.—The target was a circle two feet in diameter placed thirty inches above the floor at a distance of fifteen feet; the number of trials was ten; the score was the number of hits inside the circle.

2. *Free Throw*.—The target was the usual basket; the distance was fifteen feet; the number of trials was ten; the score was the number of baskets made.

3. *Corner Shot*.—The target was the usual basket; the position was the corner of the playing floor; the distance was twenty-four feet; the number of trials was ten; the score was the number of baskets made.

4. *Dribble*.—This was a one-hand dribble for speed; the length of the dribble was eighty feet; the score was the time, measured by a stop watch.

FOOTBALL

1. *Forward Pass for Accuracy*.—The target was a circle three feet in diameter placed three feet from the floor at a distance of thirty feet; the number of trials was ten; the score was the number of hits within the circle.

2. *Center Pass for Accuracy.*—The target was a circle two feet in diameter—placed two feet from the floor at a distance of ten feet; the number of trials was ten; the score was the number of hits within the circle.

3. *Throw for Distance.*—The test was conducted outdoors; the number of trials was two; the score was the best distance of the two throws.

BASEBALL

1. *Accuracy Throw.*—The target was a rectangle, two feet wide and three feet high, placed eighteen inches from the floor at a distance of sixty feet; a twelve-inch indoor baseball was used; the number of trials was ten; the score was the number of hits on the target.

2. *Base Running.*—The test was conducted outdoors; the distance of the run was 180 feet, starting and finishing at home plate; 1 trial was given; the score was time, measured by a stop watch.

3. *Distance Throw.*—The test was given outdoors; a twelve-inch indoor baseball was used; the number of trials was two; the score was the best distance.

TRACK ATHLETICS

1. *Fifty-Yard Dash.*—The test was given out-of-doors; one trial was used; time was taken with a stop watch.

2. *Standing Broad Jump.*—Two trials were given; the score was the best distance in inches.

3. *Shot-Put.*—The test was given out-of-doors; the weight of the shot was eight pounds; the number of trials was two; the score was the best distance.

INTELLIGENCE TEST

Terman's *A* and *B* group tests were used.

OTHER RECORDS

Height was measured in inches; weight was measured in pounds; chronological age was recorded in months.

The objectivity of measurement seems very high. The motor tests and the physical measures were all made by one man. The work was carefully done and there is no purely subjective element in any test.

The reliabilities of five of the measures are as follows:

Dribble—trial 1 with trial 2	.757
	±.023
Football pass for distance	.840
trial 1 with trial 2	±.016
Baseball throw for distance	.906
trial 1 with trial 2	±.009
Broad jump—trial 1 with	.912
trial 2	±.009
Shot put—trial 1 with trial 2	.869
	±.013

Only one trial was given in the base-running test and the fifty-yard dash. In each of these cases the reliability may be assumed to be as

high as for the dribble and probably higher since the activity is not so complex. For the accuracy tests the reliabilities were not figured; they are probably low, however, on account of the small number of trials.

II. DISCUSSION AND INTERPRETATION OF THE DATA

The intercorrelations of the various traits are shown in Table I.¹ In addition to the relationships shown in this table, the intercorrelations among all the traits were figured holding the following factors constant: (1) intelligence, (2) age, (3) height, (4) weight, (5) intelligence and age, (6) height and weight, (7) intelligence, age, height, and weight. On account of space limitations only the zero-order correlations are shown here.

The main findings may be summarized as follows:

1. The correlation between age and intelligence is negative. Such a correlation is to be expected in a limited school group.
2. Intelligence has a negative correlation with all the motor skills except those involving speed of running—the dribble, base running, and the fifty-yard dash. With the speed tests the correlation is positive, but small.
3. Chronological age has low negative correlations with the speed tests, fair positive correlations with the strength tests (football pass for distance, baseball throw for distance, broad jump, shot put) and low positive (usually negligible) correlations with the accuracy tests (basketball accuracy pass, free throw, corner shot, football accuracy pass, center pass, basketball accuracy pass, baseball accuracy throw).
4. Height correlates .812, P.E. $\pm .018$, with weight. It has negative correlations with the speed tests. The negative correlation is greatest in the 50-yard dash which measures speed of running not complicated by other activities, smaller in base running, and least in the dribble, which is most complicated by other skills than running. Height has good positive correlations with the strength tests; its correlations with the accuracy tests tend to be positive, but are so low as to be negligible.
5. Weight has negative correlations with the speed tests. With the dribble this correlation is so low as to be negligible, with base running and the fifty-yard dash it is significant. The correlations with accuracy are positive, with the exception of the football forward pass, but are so low as to be negligible.
6. In the zero-order correlations, accuracy tests have without exception low positive correlations among themselves, low negative correlations with the speed tests and low positive correlations with the strength tests.
7. In the zero-order correlations, speed tests have significant positive correlations among themselves, low negative correlations with the accuracy tests, and fair negative correlations with the strength tests.

¹ The calculations were made as a University of Wisconsin CWA project.

TABLE I.

	Intelligence	Age	Ht.	Wt.	Basketball Tests			Football Tests			Baseball Tests			Track Tests	
					Pass Acc.	Free Throw	Corn. Shot	Drib-ble	For. Pass Acc.	Cent. Pass Acc.	Dist. Pass	Throw Acc.	Run. Bases	Dist. Throw	50 Yard	Broad Jump
Age	—483 ± .042														
Height	—134 ± .041	.407													
Weight	—084 ± .054	.414 ± .045	.812 ± .018												
Basketball Tests															
Pass Accuracy ..	—177 ± .053	.082 ± .054	—010 ± .054	.086 ± .054											
Free Throw	—257 ± .051	.389 ± .046	.269 ± .050	.143 ± .053											
Corner Shot	—205 ± .052	.276 ± .051	.195 ± .051	.283 ± .051	.311 ± .050										
Dribble ..	—132 ± .053	—259 ± .051	—175 ± .053	—169 ± .053	—350 ± .048	—345 ± .048									
Football Tests															
Forward Pass Ac.	—117 ± .053	.144 ± .053	.107 ± .054	—011 ± .054	.247 ± .051	.293 ± .050	—384 ± .046								
Center Pass Acc.	—072 ± .054	.090 ± .054	.004 ± .054	.182 ± .052	.224 ± .051	.134 ± .053	.387 ± .048								
Distance Pass ..	—314 ± .049	.433 ± .044	.475 ± .042	.507 ± .040	.376 ± .047	.352 ± .048	—546 ± .038	.443 ± .044	.359 ± .047						
Baseball Tests															
Throwing Acc. ..	—277 ± .050	.185 ± .052	.161 ± .053	.181 ± .052	.232 ± .051	.221 ± .052	—277 ± .050	.246 ± .051	.283 ± .050	.300 ± .050					
Running Bases..	.234 ± .051	—418 ± .045	—291 ± .050	—518 ± .040	—259 ± .051	—335 ± .048	.505 ± .040	.344 ± .048	.221 ± .052	.511 ± .040	—232 ± .051				
Distance Throw .	—282 ± .050	.549 ± .038	.557 ± .037	.575 ± .036	.332 ± .048	.373 ± .047	—607 ± .034	.482 ± .042	.413 ± .045	.820 ± .018	.315 ± .049	.600 ± .035			
Track Tests															
50-yard Dash ...	.207 ± .052	—336 ± .048	—389 ± .046	—407 ± .045	—175 ± .053	—327 ± .048	.464 ± .043	.283 ± .050	.240 ± .051	.527 ± .039	.251 ± .051	.459 ± .043	.545 ± .038		
Broad Jump ...	—209 ± .052	.424 ± .044	.404 ± .041	.403 ± .041	.249 ± .051	.314 ± .049	.584 ± .036	.383 ± .046	.269 ± .050	.654 ± .031	.175 ± .053	.603 ± .035	.721 ± .036	.642 ± .033	.600 ± .030
Shot-put	—213 ± .053	.563 ± .044	.632 ± .041	.710 ± .041	.255 ± .051	.334 ± .049	.437 ± .037	.374 ± .042	.304 ± .045	.704 ± .031	.408 ± .053	.556 ± .035	.777 ± .037		

8. In the zero-order correlations, the strength type tests have good positive correlations among themselves, fair negative correlations with the speed tests, and low positive correlations with the accuracy tests.

9. When intelligence is kept constant and the resulting correlations are compared with the zero-order figures all correlations are slightly reduced with the single exception of the correlation between the dribble and the football center pass. The changes are very small, indicating that general intelligence is unimportant as a common factor in these abilities.

10. When chronological age is held constant and comparison is made with the zero-order correlations the following facts are observed: (a) The intercorrelations between the tests are reduced toward zero except in the cases of basketball pass for accuracy and football distance pass, basketball pass for accuracy and baseball distance throw, football accuracy pass and baseball distance throw, football center pass and baseball distance throw. (b) The correlations most reduced are those involving the shot-put, the baseball distance throw, the broad jump, and the football pass for distance.

11. When height is held constant the changes from the zero-order correlations are the following: (a) There is an increase in the size of the correlation of the basketball pass for accuracy with every other test. The change is unimportant in most cases but is pronounced in the correlations with the strength tests. (b) The correlations of the basketball corner shot and free throw with the other tests is reduced in every case except with the football pass for accuracy; the changes are greatest in the correlations with the strength tests and next in importance in the correlations with the speed tests. (c) The changes in the correlations of the football pass for accuracy and the football center pass with the other tests are minor in character. (d) In the case of the baseball throw for accuracy the correlations with the other tests decrease in every case except for the correlation with the basketball pass for accuracy; the changes are most important in the correlations with the strength tests and next most important in the correlations with the speed tests. (e) The changes in the correlations of basketball dribble with the other activities are minor. (f) The correlations of base running and the fifty-yard dash with the other activities decrease in every case except for basketball pass accuracy. No one class of test seems mainly affected. (g) In the case of the four strength tests the correlations are generally decreased except with basketball pass accuracy, football forward pass accuracy, and football center pass. The change is greatest in the intercorrelations with other strength tests and in the correlations with the fifty-yard dash.

12. When weight is held constant the following facts are observed: (a) The changes in the correlations between the basketball pass and the other tests are unimportant. (b) The correlations of the free throw and the corner shot with the other activities are decreased in every case except with the forward pass for accuracy. The changes are most pronounced in

the case of the strength tests and next most important with the speed tests. (c) The correlations of the football pass for accuracy with the other tests are increased in every case. The changes are most important in the correlations with the strength tests and next most important with the speed tests. (d) The correlations of the center pass and the baseball accuracy throw with the other tests are decreased in every case except with the forward pass for accuracy. The changes are most pronounced in the cases of the strength and speed tests. (e) The changes in the correlations of the dribble with the other tests are minor. (f) The correlations of running bases and the fifty-yard dash with the other tests decrease except with the forward pass for accuracy. The changes are most important in the case of the strength and speed events. (g) The correlations of the four strength tests with the others and among themselves are decreased except in the cases of the basketball pass for accuracy, the dribble, and football pass for accuracy.

13. When intelligence, age, height, and weight are held constant and the correlations are compared with the zero-order figures the following facts are observed: (a) The correlations of the basketball pass with the other tests are changed only slightly. (b) The correlations of the basketball free throw and the corner shot with the other tests are decreased very materially; the changes are least in the correlations with the basketball pass, the football center pass, and the forward pass for accuracy. (c) There is a material increase in the correlations of the football pass for accuracy with the shot-put, base running, football distance pass and center pass; there is a considerable decrease in its correlation with the baseball distance throw. (d) There is a considerable decrease in the correlation of the football center pass with base running. (e) The correlations of the baseball throw for accuracy with all the other tests are decreased. The changes are greatest in the cases of the shot-put, the broad jump, the fifty-yard dash, the baseball distance throw, base running, football distance pass, basketball corner shot and free throw. (f) The correlations of the basketball dribble with the other tests are changed only slightly. (g) There is a considerable increase in the correlations of base running with the football forward pass for accuracy; the correlations are decreased materially with the shot-put, fifty-yard dash, baseball distance throw, baseball throwing accuracy, football distance pass, center pass, basketball corner shot and free throw. (h) The correlations of the fifty-yard dash with the other tests are decreased in every case; the changes are greatest with the shot-put, baseball distance throw, base running, baseball throwing accuracy, football distance pass, basketball corner shot and free throw. (i) There is a material reduction in the correlations of the football distance pass with the shot-put, the broad jump, fifty-yard dash, baseball distance throw, base running, baseball throwing accuracy, basketball corner shot and three throw; its correlation with the football pass for accuracy is increased. (j) The changes in

the correlations of the baseball distance throw with the other tests are similar to those noted for the football distance throw. (k) In the case of the broad jump decreases in correlations occur with the shot-put, fifty-yard dash, baseball distance throw, base running, baseball throwing accuracy, football distance pass, basketball corner shot and free throw. (l) In the case of the shot-put material decreases occur in the correlations with the broad jump, fifty-yard dash, baseball distance throw, base running, baseball throwing accuracy, football distance pass, basketball corner shot and free throw; material increase occurs in the correlation with the forward pass for accuracy.

III. CONCLUSIONS

1. General intelligence is a minor factor in the abilities tested. It has a positive relationship with accuracy and strength and a negative relationship with speed in running. When it is held constant the intercorrelations of the various abilities are changed slightly toward zero.

2. Difference in chronological age is an unimportant factor in determining difference in ability in basketball passing accuracy, football passing accuracy, and center passing accuracy. It has an important positive relationship to ability in strength activities, a lesser positive relationship to accuracy, and a significant negative relationship to speed in running. This negative relationship to speed in running is probably due to the fact that the boys of junior high school age are grouped closely about the age of puberty and the period of rapid lengthening of arms and legs. Chronological age is a common factor that affects most of the intercorrelations between the various tests. Its effect is most noticeable in the strength tests and the speed tests and is least noticeable in the three accuracy tests mentioned above.

3. The statements concerning difference in chronological age hold true for difference in height for the most part. Height is a variable that reduces the correlations of basketball passing accuracy with the other activities, but it is a common factor that increases the positive or negative relationship among the other activities.

4. Like chronological age and height, weight is a variable that is negatively related to speed in running, positively related to strength, and has a low positive relationship to accuracy. Weight is a variable that decreases the correlations of the football pass for accuracy with the other tests, but it is a common factor that increases the positive or negative relationship existing among the other activities, especially among the strength activities.

5. Taken together age, height, weight, and intelligence are variables that reduce the relationship existing between the following activities: the football pass for accuracy with the shot-put, base running, football pass for distance, and center pass. They are common factors that increase the positive or negative relationship existing between all the other activi-

ties. When these four variables have been eliminated the important relationships remaining are the following: the negative relationship of speed in running to all the other activities and the positive interrelationship among the three speed activities; the positive relationship of the football forward pass to the strength activities; the positive interrelationship among the four strength activities, the positive interrelationship among the three football activities; the negligible positive interrelationship among the accuracy activities.

6. It is worth noting that all three of the speed activities have negative correlations varying from $-.526$ to $-.642$ with the standing broad jump. Unless the running broad jump is vastly different in its mechanical characteristics from the standing broad jump so that the two are negatively correlated it would seem impossible for it to be positively related to running speed in junior high school boys.*

7. It should be noted that the dribble is negatively related to the other basketball activities included in this study.

8. Concerning the nature of motor ability in junior high school boys: (a) Some activities, represented in this study by the shot-put, standing broad jump, baseball distance throw, and football distance pass, are positively related to age, height, and weight but have some additional factor or factors in common. This study does not define the nature of this common factor although we have called it *strength*. (b) A second group of activities, represented in this study by the fifty-yard dash, base running, and the dribble, are negatively related to age, height, and weight but have some factor or factors in common. We have called this common factor *speed in running*. It is negatively related to the common factor of the strength activities. (c) Another group of activities represented in this study by the basketball pass for accuracy, the center pass, baseball throwing accuracy, the free throw, the corner shot, and the football pass for accuracy have little relationship to age, height, or weight and have no important factor in common. It is therefore incorrect to speak of *accuracy* in a generalized meaning. Individually these activities are negatively related to speed in running and have a slight positive relationship to strength activities. (d) A fourth group of activities having possibly a common factor of *endurance* was not included in this study. (e) General intelligence is a factor irrelevant to all the motor abilities studied. (f) It is probably incorrect to speak of *general motor ability* in the same sense that we speak of general intelligence. In this study we have distinguished two general factors which we have called *strength* and *speed in running*. (Note that speed of small muscular movement as of the fingers is not necessarily included in this factor.) We have indicated the possibility of existence of a third factor called *endurance*. We have found that no general factor of *accuracy* is indicated but that the more

* In a study just completed a correlation of $-.622$, P.E. $\pm .086$, has been found between the 60-yard dash and the running broad jump.

probable explanation of facts is that there are many special factors influencing accuracy in individual skills.

9. Concerning junior high school boys as a school type: (a) The older boys have greater ability than the younger boys in activities of the strength type and lesser ability in speed of running. (b) The taller and heavier boys have greater ability than the smaller ones in activities of the strength type and lesser ability in speed of running. (c) Speed of running has a negative relationship to performance in activities of the strength type. (d) These three relationships just mentioned may be partially explained because of the growth changes, especially the lengthening of arms and legs, that are characteristic of boys near to puberty. (e) Boys of this age do not have proficiency in a wide range of motor activities. Because of irregular development and specialized ability of boys in this school group training programs need to be carefully adjusted to individuals, both to take advantage of special abilities and to promote well rounded development. (f) Each activity demanding accuracy of sensori-muscular coordination must be learned for itself. There is no general factor of accuracy.

Some Evidence of the Value of a Therapeutic Program *

By HOPE TISDALE

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SINCE the chief immediate objective of the therapeutic or corrective program is the improvement of body mechanics, this study is concerned with that aspect of the value of a therapeutic program. Other possible values, such as improvement in health, motor ability, or general efficiency, present such problems in evaluating and measuring that results could not mean much unless a tremendous number of cases could be studied under carefully planned and controlled conditions. Also the question, if there is a question, of the value to the individual of improved body mechanics, would require a great deal more information and research than the time allotted for the preparation of this paper allowed. It will be assumed, then, that good body mechanics are desirable and that a therapeutic program which improves body mechanics is valuable.

Securing objective evidence from material that is largely subjective is a rather precarious proceeding. However, it was necessary to use the material at hand, and the fact that the findings were fairly consistent should mean that the results have some significance.

A study was made of the physical examination records of 815 students of the Woman's College of the University of North Carolina, of the classes of 1931-36. Of these, 271 had had the course in correctives, and 544 had not. The comparatively small number of those who took correctives is accounted for by the fact that the classes are not composed entirely of students assigned to the work because of poor body mechanics, and by the fact that the classes are necessarily small, being limited to 10 or 15 students. Approximately 25 per cent of those taking the work are assigned to it for health reasons. Only the records of those students who stayed in college long enough to have 2 or more physical examinations were used in the study.

The basis of selection was the initial posture grade. The records of students who received a grade of C— or less in the first examination and who took correctives were compared with those of students who received C— or less in the first examination and who did not take correctives. The C— or less group was chosen, because students who take correctives for faulty body mechanics all fall within this classification. It is not

* A paper presented before the Southern District Physical Education Association Convention, March, 1934, at New Orleans, La.

possible to schedule all *D* postures in these classes, and there are many *C*— postures that actually need the work more because of poor self-correction or because of bad foot or back conditions. As a rule, since we cannot take them all, we try to take those with the poorest general body mechanics.

Before attempting to draw any conclusions from the comparison, some estimate of the accuracy and consistency of posture grading was considered advisable, as we use the subjective method of grading.

Five members of the physical education staff simultaneously graded the posture of one hundred students selected at random. The standard used was the *Posture Chart* published by the U.S. Department of the Interior. A grading range of *A* through *D*— was used. The five grades given each student were then averaged and the following observations made:

- A. 1. Examiner No. 1 had 33 grades the same as the average, 11 above, 56 below.
- 2. Examiner No. 2 had 31 grades the same as the average, 23 above, 46 below.
- 3. Examiner No. 3 had 22 grades the same as the average, 57 above, 22 below.
- 4. Examiner No. 4 had 30 grades the same as the average, 36 above, 34 below.
- 5. Examiner No. 5 had 30 grades the same as the average, 41 above, 29 below.

B. Dropping the pluses and minuses:

- 1. Examiner No. 1 had 63 grades the same as the average.
- 2. Examiner No. 2 had 67 grades the same as the average.
- 3. Examiner No. 3 had 66 grades the same as the average.
- 4. Examiner No. 4 had 62 grades the same as the average.
- 5. Examiner No. 5 had 68 grades the same as the average.

C. Exclusive of pluses and minuses:

- 1. 9 per cent of the cases had 5 grades in same classification.
- 2. 42 per cent of the cases had 4 grades in the same classification.
- 3. 94 per cent of the cases had 3 grades in the same classification.
- 4. 79 per cent of the cases had all five grades in adjacent classifications.
- 5. 21 per cent of the cases covered a range of three grades.

These figures show about the range of variation that subjective grading usually shows, and give further evidence that an objective method of grading posture that is usable in the ordinary situation is greatly needed. It will be noticed that there is a fair amount of consistency in the grading when the pluses and minuses are dropped. The average probably represents about the grade the student should have received. If the pluses and minuses are disregarded, it can be said that each examiner gave the correct grade in about two-thirds of the cases. Although it was impossible to secure an average grade for the cases used in the study, the fact that they represent the grading of ten examiners makes the results more valid than if they were the grading of one examiner.

Combining items "B 1" and "C 1," it will be seen that the average grade at entrance was *D* for the first group and *D*— for the second; at the end of the first year, *B*— for the first and *C* for the second.

COMPARISON OF POSTURE GRADES OF STUDENTS WHO HAD
CORRECTIVE WORK WITH THOSE OF STUDENTS
WHO HAD NOT

	Correctives	No Correctives
A. Number of cases studied (All receiving C— or less in first examinations).....	271	544
B. Cases having three examinations	116	174
1. Average grade		
First examination (beginning of first year).....	D	D+
Second examination (end of first year).....	C+	C
	(very near B—)	(low C)
Third examination (end of junior year).....	B—	C+
2. Percentage receiving D+ or less		
First examination	63%	55%
Second examination	10%	23%
Third examination	8%	17%
3. Percentage receiving B— or better		
First examination	none	none
Second examination	49%	16%
Third examination	59%	30%
C. Cases having two examinations	155	270
1. Average grade		
First examination	D	D+
Second examination	B—	C
2. Percentage receiving D+ or less		
First examination	74%	50%
Second examination	7%	22%
3. Percentage receiving B— or better		
First examination	none	none
Second examination	54%	20%

It should be understood that the control group was not entirely without special instruction in posture. Some is given in certain physical education classes, notably the freshman fundamentals course. There are individual and group conferences in which students are told what their faults are, how to correct them, and what exercises they should take. It is to be expected that there would be improvement in this group.

While there was improvement throughout in both groups, the improvement of the first is markedly greater than that of the second. As both groups represent the poorest postures of the entering students for the past six years, it is understandable that there was a persistence of *D* postures in both, and a fairly large proportion in the *C* class. Structural deformities and congenital peculiarities of conformation could account for this to a certain extent. The fact that there was greater improvement among the correctives group and that most of the improvement came between the first two examinations, within the period during which the course was given, presents reliable evidence that the therapeutic program is of more value in correcting poor posture than the regular physical education program.

It would be interesting to make a study of the effect of the work on

lateral conditions. There was not time for this, however. It is probable that structural curvatures would not show much change. Functional deviations, while more readily correctible, are so hard to measure without special apparatus that an accurate estimate of improvement would be impossible. In accordance with the principle that a corrected antero-posterior posture is usually accompanied by improved lateral conditions, however, it was found that there was a slightly smaller proportion of functional curvature in the corrected group.

Another item of the physical examination which should give some evidence of the effect of the work is that of correction. After the posture has been examined and recorded, the examiner gives the subject a few hints for correction and grades it "good," "fair," or "poor." It was not possible to derive much accurate data from this aspect of the examination, as the line was in many cases left blank and it could not be determined whether this meant that the individual was unable to achieve any correction, or whether the examiner forgot to mention it, or the recorder to record it. However, it was found that a greater proportion of those who took correctives had a fair or poor correction in the first examination than was the case with those who did not take it. Subsequent examinations showed a higher percentage of good corrections and blanks in the corrected group, and a higher percentage of poor and fair corrections in the uncorrected group. If we assume the blanks to mean no correction and remember that structural limitations or an already perfect posture could account for inability to correct, the conclusion is favorable to correctives.

Improvement of the feet is another item which is hard to measure from subjective evidence. Lacking a grade, which is at least a summing up of several elements and therefore likely to be more representative of conditions as a whole, there is bound to be considerable variation. Examination of the transverse arch was found to be especially unreliable. Any degree of depression, except the extreme, is so hard to judge that this part of the examination was thrown out entirely. Hallux valgus is recorded, if present, but since exercise has little or no effect upon this condition, it was not considered.

Pronation was selected as presenting fairly accurate data and as being fairly representative of general foot mechanics. A study was made of the records of the classes of 1934, 1935, and 1936. It was decided that an attempt to estimate improvement in general would be more reliable if made without particular reference to the degree of improvement, as this is too variable an element.

Results of comparison of pronation in corrected and uncorrected groups:

	<i>Number studied</i>	<i>Improved</i>	<i>Same</i>	<i>More pronation</i>	<i>No pronation in either examination</i>
Correctives	184	66%	21%	6½%	6½%
No correctives	218	34%	42%	20 %	3 %

While these figures cannot be taken as an exact picture of actual conditions, the margin of error is not great enough to account for the striking difference between the percentages showing improvement in the two groups. It is safe to say, then, that corrective work is more effective than a general program in correcting pronation.

The problem of the value of a corrective program is always complicated by the question of carry-over into daily life. A student may learn to stand, walk, and sit as well as her physical capacity allows, then cast it from her mind as soon as she leaves the gymnasium. Probably everyone who has done this sort of work has felt discouraged when she has seen former students in careless postures. It cannot be said that the work has any great value unless there is some carry-over.

In order to arrive at an estimate of the work in this respect, questionnaires were prepared and given to all those students who had had the work and were still in college. There were 130 of these. The students were told that they were not to put their names on their papers, and were asked to answer the questions as honestly as they could. It was felt that absolutely frank replies could be expected only if they were anonymous.

RESULTS OF QUESTIONNAIRE

1. Did the course in Individual Physical Education change your attitude toward posture and foot mechanics?

One hundred twenty-three, or slightly less than 95 per cent answered "Yes."

Seven, or 5 per cent answered, "No." All of these seven were checked with the answers to question number 7: "Do you believe that good posture is important?" "Why?" All had answered "Yes" and given good reasons. The assumption is that they had a desirable attitude toward body mechanics before they took the course.

2. Do you try to practice what you learned about good posture and foot positions?

One hundred twenty-six, or 97 per cent answered, "Yes."

Four, or 3 per cent answered, "No." All of these four answered "Yes" to question number 7 and gave good reasons.

3. Do you notice that there has been any improvement in your habits of standing, walking, and sitting?

One hundred twenty-two, or 94 per cent answered, "Yes."

Eight, or 6 per cent answered, "No."

4. Has anyone else noticed any improvement?

Eighty-nine, or 68 per cent answered, "Yes."

Forty-one, or 32 per cent answered, "No," or "I don't know." This is an encouraging proportion of "yeses," since it can be safely assumed that not everyone, who noticed improvement, mentioned it.

5. List the important points in correct posture.

Eighty-seven, or 67 per cent gave satisfactory replies.

Forty, or 31 per cent had one error in the list. Of these forty, two misinterpreted the question, and one said that the head should be forward. The remaining thirty-seven all made practically the same error, some saying that the shoulders should be up, and some that the shoulders should be back. This was probably a

survival of preconceived ideas, as they were never instructed in class to hold their shoulders either up or back.

Three did not answer.

6. List the important points in a correct foot position.

One hundred thirteen, or 86 per cent, gave satisfactory replies.

Thirteen, or 10 per cent, gave incomplete or incorrect replies, some saying only that the weight should be borne on the ball of the foot, one that the toes should be pointed out, and two misinterpreting the question.

Four did not answer.

7. Do you believe that good posture is important?

One hundred twenty-nine, or 99 per cent plus, answered, "Yes."

One did not answer.

Why?

One hundred twenty-nine, or 99 per cent plus, gave reasonable replies, some giving health, others appearance, and many both, as reasons for considering good posture important.

One did not answer.

8. How might we have helped you more?

Ninety-one, or 70 per cent, left this blank or said that there was no way in which they could have been helped more.

Thirty-nine, or 30 per cent gave specific suggestions.

Sixteen suggested more exercise, more classes, or more than one semester of work.

Six suggested more encouragement and advice at the end of the course, or more follow-up afterward.

Eleven suggested more practice in walking, standing, and sitting in good posture.

These comments should be of value in carrying on the work in the future, as they indicate where further emphasis may be needed.

The results of the questionnaire show that there is a definite psychological carry-over from the work in most cases, and a consequent improvement in general body mechanics which is probably fairly permanent. Whether or not the effects are as favorable as they appear could be determined only by the absolute knowledge of how honestly the questions were answered.

The silhouettes illustrate some of the typical problems of a corrective program; some of the reasons why a course in correctives does not always show perfect results.

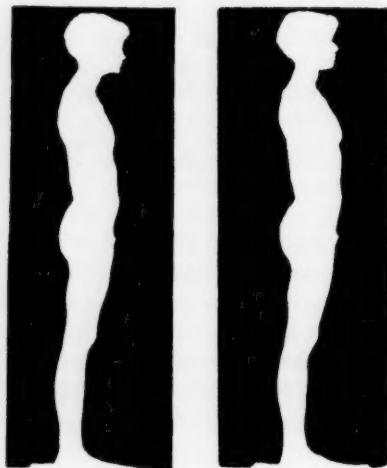
SUMMARY

1. There was considerably more improvement in the body mechanics of students who had the course in correctives than was the case in the control group who had not.

2. Most of the improvement in posture of the correctives group came within the period during which they had the work; about half of the improvement of the control group came between the first two examinations and about half between the last two examinations.

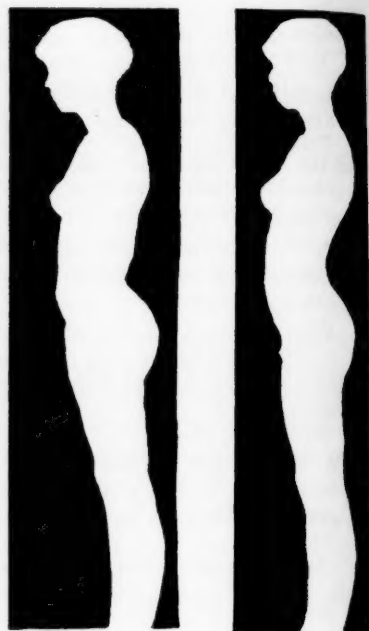
3. The results of the questionnaire show that in the majority of cases, there is a fairly permanent improvement in body mechanics.

CASE NO. 1
First Examination Second Examination



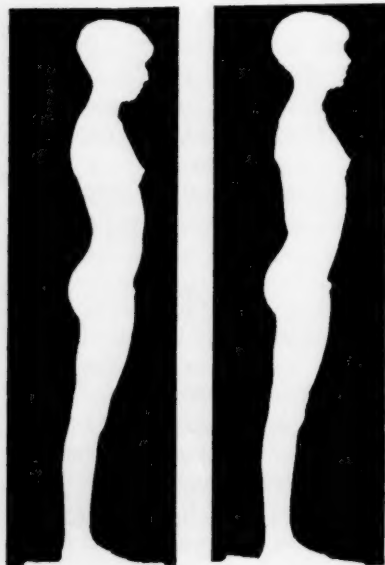
Showing habitual posture before and after one semester of correctives. Note persistence of hyperextended knees with accompanying lordosis.

CASE NO. 2
Habitual Corrected

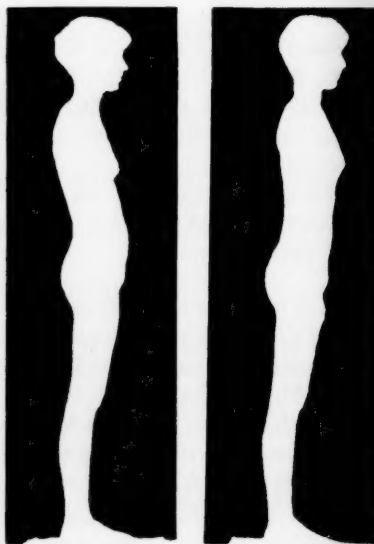


Showing severe kypho-lordosis with limited correctibility.

CASE NO. 3
First Examination



Second Examination



Habitual

Corrected

Habitual

Corrected

Showing improvement in corrected posture, but practically none in habitual posture.

Causes of College Sport Accidents; Preliminary Findings from a Study of Safety in College Physical Education

By FLOYD R. EASTWOOD

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THIS study of accidents in college physical education was made during the academic year 1932-33 by the writer and was the second safety study in a series of three planned.* The first study was completed in October 1932 by Dr. Frank S. Lloyd and concerned itself with physical education accidents on the secondary level. The college study recently completed by the writer, covered accidents to men and women in activities associated with the program. In addition an intensive survey of college football accidents was made during the 1932 season. A third survey has just been launched by H. E. Brown and will concern itself with all accidents in the elementary and junior high schools in New York City.

These three surveys are a result of the cooperative endeavors of national committees, the School of Education, New York University, and the National Bureau of Casualty and Surety Underwriters.

I. SCOPE OF THE COLLEGE STUDY

Seventy-five women's colleges with a population of 74,225 students reported 507 accidents and 1,723 days lost from physical education classes. Thirty-eight men's institutions having an enrollment of 68,472 reported 888 accidents and 1,367 physical education class absences. In addition to the year-round study, an intensive study of college football accidents was made during the fall of 1932. The seasonal study covered 157 colleges with an enrollment of 131,416. These institutions reported 1,836 accidents and 14,396 days lost from football periods. Colleges were sectionally located in each of the three surveys.

This report of pertinent findings will only be devoted to the incidence of injury by parts of the body injured, the types of these injuries, classification of sport hazards, causes of accidents, causes by part of body, and contributory causes of accidents.

II. PART OF BODY AND TYPE OF INJURY

A. Women.—The ankle was most frequently injured, the hand, knee, and face had the next greatest incidence in the order named. The ankle

* A paper presented before the Therapeutic Section of the American Physical Education Association Convention, April 1934, at Cleveland, Ohio.

injuries were usually due to joint involvements. The hand suffered more often as a result of joint and muscle injuries, while knee injuries, as would be expected, had twice as many joint involvements, as any other type of injury.

B. *Men*.—Joint injuries to the ankle and knee and lacerated or contused wounds of the face were reported most often in the men's data.

C. *Football*.—Injuries to the knee, ankle, and shoulder joint stood out most prominently in this special survey.

III. CLASSIFICATION OF SPORTS BY HAZARD

In order to present a valid basis for comparisons, sports were ranked on accidents and days lost per one thousand exposures. These exposures were computed from questionnaire returns. The arbitrary classifications presented below give a relatively accurate picture of degrees of similarity and difference to which sports are hazardous.

A. *Women*.—The following table graphically shows the placement of sports according to their hazardness.

TABLE I
RANK CLASSIFICATION OF SPORTS BY DEGREE OF HAZARD
COLLEGE WOMEN

<i>Accidents per 1000 Exposures</i>		<i>Classification</i>	<i>Days Lost Per 1000 Exposures</i>	
<i>Sport</i>	<i>Inc.</i>		<i>Inc.</i>	<i>Sport</i>
1. Apparatus	11.4	Very Hazardous	42.7	Apparatus
2. Riding	10.1		33.1	Riding
3. Field Hockey	7.8	Highly Hazardous	25.2	Basketball
4. Basketball	6.9		24.7	Soccer
			22.2	Field Hockey
5. Speedball	5.6	Hazardous	16.2	Tumbling and Stunts
6. Games and Relays	5.1		15.0	Deck Tennis
			12.0	Track and Field
			8.2	Games and Relays
7. Lacrosse	3.3	Low Hazard	7.3	Calisthenics
8. Soccer	3.1		6.3	Archery
9. Track and Field	3.1		5.8	Lacrosse
10. Tumbling and Stunts	2.9		4.3	Indoor Baseball
11. Fencing	2.8		4.1	Golf
12. Indoor Baseball	2.5		3.5	Dancing
13. Crew	2.2			
14. Deck Tennis	2.1			
15. Badminton	1.2	Minimum Hazard	2.3	Swimming and Diving
16. Archery	1.1		2.0	Tennis
17. Golf	1.0		1.4	Speedball
18. Tennis	1.0		1.4	Crew
19. Dancing	.88	Negligible Hazard	.6	Volleyball
20. Swimming & Diving	.80		.0	Badminton
21. Volleyball	.68		.0	Fencing
22. Calisthenics	.64			

B. *Men.*—In the table below the arbitrary classification of sports will be found.

TABLE II
RANK CLASSIFICATION OF SPORTS BY DEGREE OF HAZARD
COLLEGE MEN

Accidents Per 1000 Exposures		Classification	Days Lost Per 1000 Exposures	
Sport	Inc.		Inc.	Sport
1. Football	87.9	Very Hazardous	512.2	Football
2. Horse Polo	11.2		74.7	Horse Polo
3. Wrestling	10.7		24.7	Wrestling
4. Lacrosse	9.3	Highly Hazardous	10.4	Crew
5. Soccer	6.1		7.5	Cross-Country
6. Crew	5.3		5.3	Heavy Apparatus
7. Boxing	4.6		5.2	Soccer
8. Touch Football	3.4		4.7	Touch Football
			4.4	Baseball
9. Basketball	2.5	Hazardous	3.9	Boxing
10. Ice Hockey	2.5		2.9	Lacrosse
11. Heavy Apparatus	2.1		2.3	Basketball
12. Handball	1.6		2.2	Tumbling and Stunts
13. Baseball	1.5			
14. Fencing	1.3			
15. Cross-Country	1.0	Low Hazard	1.1	Ice Hockey
16. Speedball	1.0		1.0	Track and Field
17. Miscellaneous Games	1.0		.9	Handball
			.9	Volleyball
18. Track and Field	.7		.7	Miscellaneous
19. Swimming & Diving	.6		.6	Tennis
20. Calisthenics	.3		.3	Calisthenics
21. Games and Relays	.3		.2	Swimming and Diving
22. Volleyball	.2		.0	Games and Relays
23. Indoor Baseball	.1		.0	Speedball
24. Tennis	.1		.0	Indoor Baseball
25. Tumbling & Stunts	.1		.0	Fencing

IV. CLASSIFICATION OF DESIGNATED CAUSES OF ACCIDENTS

The twenty-three causes of accident were arbitrarily placed under three headings; inadequate leadership, improper facilities and equipment, and causes due to the nature of the game. This grouping presented the following interesting conclusions.

A. *Women.*—Inadequate leadership caused 149 accidents (29.3 per cent) and 506 days lost (29.3 per cent). Improper equipment and facilities account for 138 accidents (27.2 per cent) and 401 days lost (23.2 per cent) while causes due to the nature of the game numbered 220 accidents (43.5 per cent) and 816 days lost (47.5 per cent).

Leadership, facilities, and equipment are correctable; thus one sees that 56.5 per cent of all accidents and 52.5 per cent of all the days lost may be eliminated or materially reduced, while the nature of the games

played in these colleges accounts for only 43.5 per cent of the accidents and 47.5 per cent of the days lost.

B. Men.—Using the same classification as above it was found that with better leadership and more adequate facilities and equipment, 31 per cent of the accidents and 40.3 per cent of the days lost might be partially or wholly prevented. The remaining accidents (69.0 per cent) and days lost (59.6 per cent) would only be reducible by improvement of the present rules.

C. Football.—When the thirty-one reported causes of accidents were classified as in the men's and women's groupings it was evident that 23.6 per cent of the accidents and 23.8 per cent of the days lost might be reduced without changing the game at all while we may predicate that 76.4 per cent of the accidents and 76.2 per cent of the days lost are to be expected with the game as it now exists. This conclusion is verified by the 1933 findings which approximated the same figures.

V. CAUSES OF ACCIDENTS IN THE HAZARDOUS SPORTS

A. Women.—1. Heavy Apparatus.—Lack of training and improper landing cause the greatest number of accidents but the more serious accidents reported were "unavoidable," "old injury," and "fall from apparatus."

2. Riding.—Most of the riding accidents resulted from falling or slipping or carelessness. Poor field surface and falling or slipping caused the most serious accidents.

3. Field Hockey.—The causes most frequently mentioned were "struck by piece of play equipment," "unavoidable," and "collision with another player" while the most dangerous causes listed were "poor surfacing" and "tripping over an extraneous object."

4. Baseball.—"Colliding with another player," "falling or slipping," and "struck by piece of play equipment" were causes most frequently mentioned. The most serious accidents cited "fatigue" and "unavoidable" as the most prevalent causes.

B. Men.—1. Football.—Accidents classified as "unavoidable," "collision with another player" or "unnecessary roughness" generally were the most frequently mentioned causes; while the most serious accidents were caused by "poor officiating," "relaxation of the injured," "a result of an old injury," or because the "playing area was too small."

2. Horse Polo.—Few accidents were reported, but each one had a high severity incidence and was caused either by "collision with another person," "falling or slipping," or "struck by play equipment."

3. Wrestling.—Most of these accidents are reported as "unavoidable" or due to "falling or slipping." The most serious of the reported causes were mentioned as having resulted from "striking the mat," because of "unnecessarily crowding the facilities," or as having been "kicked by an opponent."

VI. CAUSE OF ACCIDENT BY PART OF BODY INJURED

A. *Women*.—1. Ankle.—Individuals, "colliding with objects" or "falling or slipping," injured their ankle most frequently, while the most serious injuries occurred because it was "unavoidable" or because of "tripping over play equipment or extraneous objects."

2. Hand.—Being "struck by piece of play equipment" and when the accident was designated as "unavoidable," resulted in more accidents to this part of the body. The most severe injuries occurred because of carelessness and lack of training.

3. Knee.—The knee was injured most often due to "falling or slipping," when the individual "collided with an object" or was "struck by piece of play equipment." The most serious accident occurred because of "poor flooring."

B. *Men*.—1. Ankle.—The causes that usually were associated with ankle injuries were "falling or slipping" and "unavoidable." The most serious accidents resulted from being "stepped on," "improper landing," "unnecessary crowding," and "carelessness."

2. Knee.—Most of the knee injuries reported were due to "unavoidable causes," "falling or slipping," or "collision with another person." The most serious accidents resulted from "unnecessary crowding" and "collision with another person."

3. Face.—Such injuries occurred most frequently when associated with "falling or slipping," or were listed as "unavoidable." The incidence severity was highest when the individual was "struck by piece of play equipment."

VII. CONTRIBUTORY CAUSES OF ACCIDENT

A. *Women*.—1. The accidents and days lost per thousand exposures is reduced in ninety-eight out of every one hundred cases where a *physical examination* is given before the student is allowed to enter intramural competition.

2. The teacher with *less than three years of experience* has a slightly lower mean number of accidents per thousand exposures than those with more than three years of experience (in ninety-eight cases out of every hundred). This may point toward an improved emphasis on safety during the training period of the more recent graduates.

3. *Indirect safety instruction* reduces the days lost in ninety-four cases in every hundred while direct safety instruction increases the days lost exposure rate.

4. The best procedure in *reporting accidents*, if days lost are to be minimized, is to send a written report to the chairman of the department.

5. In order to reduce the days lost incidence per thousand exposures the *college administration should pay all costs*.

B. *Men*.—1. The best procedure in cutting down accidents in inter-collegiate competition is to have either the *coach select the squad* or to

have the individual *selected through proficiency in intramural games*. Proficiency in intramural games reduces materially the days lost exposure rate.

2. The family or school physician's *opinion* proves to be better in the matter of *excusing* individuals from physical education.

3. An *examination by family doctors*, or a *college physical examination*, is the best procedure to follow when determining a student's fitness for intramural competition if the accident exposure rate is to be lower.

4. The use of *student leaders* reduces the accident exposure rate. Where they are used for the *entire class instruction*, the accident and days lost incidence per thousand exposures further is reduced.

5. Indirect safety instruction is more valuable than direct instruction in reducing the accidents per thousand.

6. The days lost incidence is materially reduced if a physical educator or doctor renders *first aid* rather than a student.

7. A *doctor available* at intramural and intercollegiate games and practices reduces materially the days lost incidence.

8. A *required physical examination* for all periods (class instruction, intramural, and intercollegiate) reduces the accidents and days lost mean incidence per thousand exposures.

9. Where the college *administration pays part of the costs* or the college *athletic association pays all*, the days lost from injuries is reduced.

C. *Football*—1. *Four weeks of training* gives the lowest mean number of accidents.

2. *Six to eight days of practice* before the first scrimmage is the best procedure to reduce the number of days lost per thousand exposures.

3. *Two days of fundamentals* per week reduces number of days lost.

4. Where *not more than thirty minutes* is devoted to scrimmage the accident incidence per thousand is lowest.

5. If a complete *medical examination* is given before the first game, both the accident and days lost incidence is reduced nearly in half.

6. Where the *college athletic association pays all injury costs* the days lost incidence is materially reduced.

7. At least *four years of coaching experience* is necessary to reduce the days lost per thousand exposures.

8. The coach with only *one year of experience* has the highest accident incidence.

VIII. SUMMARY

1. The ankle, hand, and knee are the parts of the body most frequently injured in women's sports. These injuries usually involve joints.

2. Joint injuries to the ankle and knee are most prevalent in men's sports.

3. In football, injuries to the knee, ankle, and shoulder joint were most frequent.

4. The very hazardous women's sports are heavy apparatus and riding, while the highly hazardous sports are field hockey, basketball, and soccer.

5. Football, horse polo, and wrestling rank as highly hazardous men's sports.

6. With better leadership, facilities, and equipment accidents to women may be reduced 56.5 per cent and the days lost 52.5 per cent.

7. Thirty-one per cent of men's sports accidents and 40.3 per cent of the days lost from these injuries can be wholly or partially prevented.

8. In football the present nature of the game accounts for 76.4 per cent of the accidents and 76.2 per cent of the days lost from practice. The remaining 23.6 per cent of the accidents and days lost are due to inadequate leadership and faulty equipment and facilities which are remedial without changes in the present game.

9. Practically all of the high ranking causes of serious accidents in women's and men's sports, as well as football, were due to causes which could have been prevented or minimized by better leadership and adequate facilities.

10. A physical examination before participation in intramural, intercollegiate, or class instruction reduces the accidents per one thousand exposures in men's activities.

11. The use of student leaders reduces the accident exposure rate for men.

12. The college administration should pay part of the costs for *all* injuries if the days lost rate per one thousand exposures is to be reduced.

13. The college administration or athletic association should pay all expenses for intercollegiate team injuries if the days lost per one thousand exposures is to be reduced.

14. Four weeks of preseason football preparation gives the lowest accident rate per one thousand exposures.

15. At least four years' football coaching experience is necessary to reduce the accident rate.

IX. RECOMMENDATIONS

1. More emphasis should be placed on leadership, improved facilities and equipment, to assure the advance of our present sport programs.

2. Improvement is necessary in protective equipment in all sports to reduce joint injuries associated with the ankle, knee, and shoulder.

3. Additional stress should be placed on special activities to strengthen the tissues around these joints.

4. A need for rule changes is indicated in certain men's sports so that unnecessary hazards are eliminated and at the same time not detract from the participant's interest and thrill received.

5. Football must have a longer preseason training period.

Standards in Physical Education Costumes for Girls and Women

By Miss CLARE SMALL, *Chairman*

INTRODUCTION

THIS monograph on "Costumes for Girls and Women" was sponsored by the Women's Athletic Section of the American Physical Education Association and prepared by a committee under the chairmanship of Miss Clare Small, Head of the Department of Physical Education for Women, University of Colorado. The report was approved by the Women's Athletic Section at the Annual Convention of the Association at Cleveland, Ohio, April 18-21. Respectfully submitted by the Committee:

Lera Curtis, Assistant State Director of Physical Education, Lansing, Michigan

Christine Dobbins, Inspector of Athletics, New York City Schools, 157 East 67th Street, New York City

Caro Lane, Georgia State College for Women, Milledgeville

Elizabeth Maris, Germantown Friends School, Germantown, Pennsylvania

Violet Marshall, University of California, Berkeley, Department of Physical Education for Women

Marion Meigs, Y.W.C.A., Passaic Ave. & Prospect St., Passaic, New Jersey

Bernice Miller, Y.W.C.A., University of Nebraska, Lincoln

Dr. Ethel Saxman, University of Alabama, Tuscaloosa,

Alice Wilmarth, Department of Physical Education for Women, Washington State Normal School, Ellensburg

Clare Small, University of Colorado, Boulder—*Chairman*.

The costumes worn by women in any age are influenced by the many forces which make up the civilization in which they live. Quite recently in America we have become conscious that our civilization has undergone profound changes, and that our activities, our ways of living, our philosophy, and our institutions have changed. One event of great significance is the emergence of woman from the home into almost every field of endeavor. There can be no doubt that this has changed her standards and her style. The binding, bunglesome clothes, the long hair, the elaborate coiffures, and the hatpins have largely disappeared, and the sickly, ailing woman is no longer a fashionable type. Health and

efficiency are the newer standards which must have a prominent part in directing her choices if she is to keep her place in her changing sphere.

The evolution of women's clothes in the last few decades has been coincident with the rise of her diversified interests and activities. The practicability of the everyday dress of the modern woman presents a sharp contrast to the styles of the "gay nineties." Women's clothes today are loose, comfortable, and hygienic, and are adapted to the exigencies of modern life. The prominence of women's sport clothes is an example of this.

The style of costumes for athletic and gymnastic use has followed this same general trend. Many of us remember the long, full, heavy, woolen gymnasium suits, the clumsy black leather gymnasium shoes, and the old full-skirted bathing suits and ruffled caps. Present-day costumes are designed for freedom of movement, economy in material and upkeep, and are in accordance with hygienic standards.

In order that styles in our athletic costumes of today shall embody the new principles of dress and yet not go beyond the dictates of good taste, it is necessary that we have standards to guide us. In Miss Mabel Lee's excellent article, "A Survey of Athletic and Gymnastic Costumes Used by American Women," in the March, 1932, issue of the *RESEARCH QUARTERLY* of the American Physical Education Association,¹ she sets forth in detail the prevalent styles, materials, colors, and costs of our present athletic costumes. The standards set up in this paper are based partly on the results of this survey and on a survey made by the Committee which included opinions and statistics of a limited number of teachers of physical education and of manufacturers of physical education costumes.

After reading Miss Lee's article and studying the catalogues of the various manufacturers, one concludes with her that there is no one typical gymnastic, athletic, or dancing costume for all groups and no one material for all costumes. We shall attempt to show trends in material, color, and styles, and set up standards to which these should conform, in so far as this is possible.

TRENDS IN MATERIAL

The most widely used material in athletic apparel at the present time is cotton and there seems to be good reason for its almost universal use. Cotton is the least expensive of all fabrics in this country. It is more easily laundered than any material except linen, and it promotes bacterial growth less than any material except linen. It is now possible to

¹A comprehensive questionnaire on athletic, gymnasium, dancing and swimming costumes for girls and women was sent by Miss Lee to 650 organizations, including colleges, preparatory schools, normal schools, high schools, Y.M.C.A.'s, industrial organizations, and athletic clubs. Every state in the Union was represented in each group as far as possible. Of the 650 questionnaires sent, 320 replies were received. It was on these replies that her survey was based.

obtain cotton cloth in absolutely fast colors owing to new processes in dyeing developed within the last ten years. The textile industry has also been enormously affected by the new *Sanforizing* process by which the shrinkage of goods can be reduced to the zero point.

Cotton, although normally a weak fibre, can be made into a durable material by using a hard twisted thread of long staple fibres in both warp and woof. The count of warp and woof for material for athletic purposes should be about 48 x 48 in order that it be closely woven and be balanced in strength. Cotton is greatly strengthened when it has been mercerized.

Wool, on the other hand, is expensive when compared to cotton. It is very absorbent, both of body moisture and grease, and promotes bacterial growth more than cotton. Next to silk it is the strongest fibre we have. It is the warmest material because of the incorporation of air in its meshes due to the curliness and wiriness of its fibre and because evaporation is slow. This may or may not be an advantage. Wool is often irritating to the skin.

The great care required in the laundering of wool makes it impractical for use in gymnasium costumes. It shrinks disastrously unless handled very carefully. This fact is substantiated by Miss Florence Bedell of the University of Colorado in a piece of research undertaken for the Home Economics Association.² Eighty pieces of wool materials were washed to discover the effects of temperature, soap, and handling. It was found that extreme temperatures of heat or cold were very damaging. Naphtha soap was the least harmful and brown laundry soap (which contains a good deal of resin) was the most harmful. Neither temperature nor soap was as bad in effect as the type of handling. Wool should be squeezed, not rubbed, when washed, for rubbing causes more shrinkage and "felting" than either extreme temperature or strong soap. From this discussion it is evident that dry cleaning is often the most satisfactory method of cleansing wool materials if expense is not considered. However, when the *Sanforizing* process is applied to woolen goods on a large scale, the problem of laundering should disappear.

TRENDS IN COLOR

The change from sombre black to a wide variety of colors has been marked. One-piece suits, blouses, knickers, bloomers, and shorts are made in green, blue, tan, white, and most pastel shades. According to the manufacturers of gymnasium clothing, the leading colors at the present time are blue and green. Cities now seem to be adopting one color for all schools so that students transferring from one school to another may use the same suit. The most popular color for blouses is still white. Two-piece suits in contrasting colors are much more widely used than in one color.

² Florence Bedell, *Different Methods of Washing Woolen Materials*. Unpublished.

TRENDS IN STYLES

THE ONE-PIECE COSTUME

Undoubtedly the one-piece cotton suit is the most popular suit at the present time. It is used almost universally in junior high schools, widely in the senior high schools and in colleges. Comparative figures were available from only one manufacturer which were given as follows:

Junior high school—one-piece sleeveless gymnasium suit—romper type.

Senior high school—(1) one-piece sleeveless gymnasium suit—75%.

(2) same but with short sleeves—20%.

(3) two-piece suit—5%.

College

(1) one-piece sleeveless gymnasium suit—romper type—33 $\frac{1}{3}$ %.

(2) same, but with short sleeves—60 $\frac{2}{3}$ %.

(3) two-piece suits—6%.

One manufacturer made the following statement: "The trend in costumes for the past few years has been toward the one-piece cotton suit, but it is interesting to know that the majority of women's colleges in New England are using the circular bloomer, broadcloth step-in, blouse and jersey combination."

Another manufacturer wrote: "The best selling suit for the gymnasium in the junior and senior high schools is a one-piece suit. For the college many one-piece suits are used but there are quite a few colleges and universities which today are using knickers and blouses in colors. In our opinion, the trend in colleges and universities is away from the one-piece suit."

A teacher of physical education on the Pacific Coast wrote to the effect that the colleges and universities in that region wore blouses and knicker-bloomers or shorts and that the great majority of public schools used the black knicker-bloomer or shorts with a white blouse. Also that where shorts were the exception a few years ago, they were much more usual at the present time.

The style in vogue in 1929 was the single sleeveless romper suit of the bloomer type, with belt, which buttoned inward on one shoulder and under the arm. More and more schools now seem to favor the double shoulder opening with buttons facing outward. This is probably due to the greater speed in dressing and undressing and to the possibility of skin abrasions from buttons facing inward.

Other types of one-piece costume are the romper suit with short sleeves, the romper suit with buttons down the front, and the jumper suit with guimpe. These are not as practical or as inexpensive as the single sleeveless romper suit, but a small group preferred them.

Miss Lee made the following statement concerning the length of the bloomer and short:

"There are four becoming lengths used: (1) the length coming all the way down to the knee, (2) the length coming three-fourths of the way down to the knee,

(3) the length coming only half-way to the knee, and (4) the extremely short length. The first and third mentioned tied for honors in the groups as a whole, and also within the college and high school groups. The very short bloomer is found only in two high school groups and represents only 2 per cent of the whole one-piece costume class. Full-length bloomers and one-half to the knee length each claims 43 per cent of the one-piece costumes. The three-fourths-to-knee claims 10 per cent.³

The present trend seems to be slightly longer than the length coming half way to the knee.

This paragraph shows the great change in the length of bloomers which has swept the country in the last ten years. It almost seems that bloomer lengths have gone from one extreme to the other. Good taste, comfort, and the judgment of the community group should be the guides which determine this length. If we set the range for the bottom of the garment between knee-length and half way to the knee, we have a standard which is neither too conservative nor too radical, and one which is satisfactory to 93 per cent.

THE TWO-PIECE COSTUME

The two-piece costume consists of a shirt type of blouse worn inside the waist band, or a middie worn on the outside, and knickers, bloomers, or shorts.

The blouse worn on the inside of the bloomer is a much trimmer costume for the majority of girls. It should be provided with a "teddy" finish long enough not to bind, or with drawers, to prevent it from pulling away from the belt of the bloomers. The sleeve length now almost universally adopted is that five to seven inches below the shoulder seam and three to five inches below the underarm seam. Long sleeves soil very quickly, shut out sunlight, and are not so comfortable as short ones. There is no objection to a shirt without sleeves except from the point of view of custom. A sleeve of some sort is an expected part of a shirt, and presents a more tailored appearance. From Miss Lee's questionnaire we found that 61 per cent preferred short sleeves, 22 per cent no sleeves, and 13 per cent long sleeves. The present style is overwhelmingly in favor of the short sleeve.

Blouses which slip on over the head are the most practical because they have no fastenings, and they are preferred by most organizations.

Whether the knicker, bloomer, or short is selected is a matter of individual taste. Miss Lee found that of those organizations using the two-piece suit, 53 per cent used bloomers, 31 per cent knickers, and 14 per cent shorts. Colleges and normal schools preferred knickers and other groups bloomers.

Shorts have recently become fashionable outside of the physical education world, so that we can include them as one type of athletic costume

³ Mabel Lee, "A Survey of Gymnastics and Athletic Costumes Worn by American Women," *RESEARCH QUARTERLY*, III: 1 (March, 1932), 5-47.

for schools. Like all of our garments, however, they must be properly cut to be attractive for, as Miss Lee has so aptly said: "Shorts that are not cut right are *awful* to look upon." The short has one advantage over the knicker-bloomer and the bloomer in that it does away with the necessity of elastic in the legs.

THE OVERBLOUSE

The overblouse should be regarded as an accessory to the two-piece costume. It is usually a V-neck, sleeveless jersey of cotton or wool. If expense is not an item in an institution it can be regarded with favor because it completes a very attractive costume. However, many girls do not like the overblouse because of the additional warmth. Only one-fifth of the organizations replying to the questionnaire use them.

OVERGARMENT FOR OUT-OF-DOORS

It is desirable that an overgarment of some type be included for out-of-door wear. For this purpose sweaters, sweat shirts, leather jackets, and blazers may be used. It seems unnecessary to require students to buy any particular type of overgarment, as some are very expensive, uniformity is not necessary or desirable, and the majority of students usually possess one of the above styles.

UNDERGARMENTS

The prevailing custom seems to be that there is seldom a requirement regarding the type of underwear worn, probably because it would be difficult to enforce. It is, however, a good plan to urge that for hygienic reasons it is better not to wear the same lingerie with street clothes and with athletic costume.

HOSIERY

Ankle socks are now universally used. They are recommended in preference to other types for several reasons. Direct sunlight on the body is considered to be a benefit, and when play can be out-of-doors the wearing of ankle socks exposes more body surface to the sun. Socks are comfortable as well as being inexpensive, and they can be laundered easily. The use of ankle socks eliminates the garter and the gap between the end of the bloomer and the stocking.

The survey showed that 42 per cent of all institutions used ankle socks, 28 per cent the full length stocking to meet the costume, and 11 per cent a stocking just below the knee. Recent inquiries show a much higher percentage using ankle socks. At the present time it is customary to wear no stockings with dance costumes and bathing suits, and no one thinks it is immodest. It is possible that the day is almost here when the same freedom will be accorded all athletic costumes. Naturally stockings will have to be worn with certain types of activities such as rope climbing, where there is danger of injury.

FOOTWEAR

The most popular shoe and the one best adapted to athletic wear is of ankle height with a canvas top and rubber sole. Ninety per cent of all groups used this style of shoe. Fifty years in the market give ample proof of the practicability of this style of shoe. It is flexible and yet gives support to the foot and ankle. It should be made so that it conforms to the shape of the foot without being clumsy or too heavy and to give full ankle extension. Whether a shoe with a spring heel or no heel is used is a matter of individual preference. However, 59 per cent of the groups preferred the spring heel in 1929.

THE SPECIAL COSTUME FOR EXTRAMURAL ACTIVITIES

There is no justification for a "special" costume for extramural activities in a program of physical education which is an integral part of the educational scheme. Such costumes as described in the survey are indefensible from the point of view of the welfare of the girl, sound educational practice, and school finance. Interscholastics should never diverge from the principle of sport for sport's sake, and if this is the important element the regular physical education costume meets all of the requirements of a suitable costume.

It is interesting to note that only 4 per cent of the entire group reached by Miss Lee reported a special costume for extramural activities, which seems to indicate that women's athletics have not followed in the extravagant footsteps of men's athletics.

THE DANCE COSTUME

There is no uniformity in the dance costume. However, there seems to be a definite trend toward a leotard or a swimming suit, either of which makes a good work costume at small cost. Many schools use the regular gymnasium costume for class work, some the romper practice costume of gingham, while many still use the so-called traditional dance costume (flowing robe of varying length over form-fitting Wisconsin undergarment).

The undergarment should give adequate protection and support. The most popular (Wisconsin) type is a knitted cotton suit which is similar to a bathing suit. This is usually dyed to match or to contrast with the overgarment.

"Most organizations require the use of barefoot sandals, while many do barefoot work."⁴ Until the world-wide epidemic of athlete's foot subsides it is a matter of protective hygiene to require a barefoot sandal. Athlete's foot and other common skin diseases are highly contagious and every precaution should be taken to prevent their spread.

THE SWIMMING SUIT

The most widely used swimming suit is the gray cotton one-piece suit without the short skirt. It is made of knit jersey and should be elastic

⁴ *Ibid.*

and form fitting. The crotch should be reinforced and the seams double felled. It usually opens on the left shoulder with a rust proof button, preferably rubber, facing outward.

The wide use of the cotton suit can be explained on two grounds. It is inexpensive compared to the woolen suit and it is much more easily laundered. Wool is undoubtedly a better material for a bathing suit for many reasons. The woolen suit fits much better and retains its shape far better than the cotton suit. It is warmer because of its absorbent qualities, and it is more comfortable. The woolen suit is now made of a very flat nap and in fast colors so that it does not shed or lose color. Organizations that use it report complete satisfaction from the girls and from the engineers in charge of the sanitation of the pool. It is possible to buy satisfactory laundering and sterilizing apparatus for this type of suit. (Note the implications for the Sanforized woolen suit.)

PRICE TRENDS

The price range for the suits listed above, quoted from statements by the manufacturers this spring, are as follows:

One-piece sleeveless romper suit for the junior high school...	\$.90—\$1.75
One-piece sleeveless romper suit for the senior high school and college.....	1.00— 2.25
One-piece sleeveless romper suit with short sleeves for the senior high school and college	1.75— 2.25
Two-piece cotton suit	2.00— 2.25
Three-piece wool bloomers, wool jersey, and broadcloth blouse	8.00—15.00
Leotard	2.00
Wisconsin undergarment	1.00
Cotton bathing suits .....	.65— 1.25
Wool bathing suit	1.62
Cotton ankle socks .....	.15— .25

The price of any costume beyond the manufacturer's charge depends upon how the suit is distributed by the school. If the suit is bought at a local store by the student, the price will naturally be higher than when the school business office or a cooperative book store purchases the suits from the manufacturer.

STANDARDS FOR COSTUMES FROM THE STANDPOINT OF:

1. *Hygiene.*—That part of the costume which is worn next to the skin should be of a material which allows frequent laundering. (It might be well to mention here also that only proper supervision will insure that garments will be laundered when necessary.)

As much of the body (neck, arms, and legs) may be exposed as is compatible with temperatures in which the costume is worn, and with the social standards of those who are likely to wear the costume or observe those wearing it.

The costume should be planned so that a complete change from street clothing is necessitated, to decrease resistance to taking showers or the

likelihood of wearing clothing damp from perspiration after the physical education period.

Elastic or restricting elements of any kind should be avoided whenever possible.

2. *Aesthetic Considerations.*—Uniformity is the greatest contributing factor here, unless the individual standards are exceptionally high. To this end, the costume should be designed so that a minimum of individual costume adaptations are possible (i.e., varied length of bloomers).

The costume should be firm and immaculate in appearance and fit the wearer.

Whenever possible, pleasing colors should be used.

The costume should be chosen which suits the entire group best.

3. *Social Standards.*—Styles in professional dress should follow the current trends of the mode and should not seek to lead them. It is well to remember that the athletic costume adopted for a community should depend upon the particular situation in the surroundings.

4. *Utilitarian Considerations.*—The garment should avoid unnecessary weight and fullness, in order that movements shall be as free and unimpeded as possible. Careful consideration should be given to the demands made by all types of physical activity for which the costume is used. Further, it is of advantage to the instructor to have the costume as revealing of body segmentation and mechanics as is compatible with prevailing social standards and with lack of self-consciousness on the part of the student.

5. *Material.*—

a) *Cotton Materials for the Athletic Costume.*—There are many nationally known cotton materials which possess all the qualities needed to withstand the wear given them by participation in physical education activities. Some of the better known ones are:

Indian Head, described in one book on textiles as follows: "heavy firm fabric; white, colored, or figured. Excellent wearing material; does not fade. Plain weave. Width, thirty-six inches."

Pepperell suiting.

Everfast suiting.

Peterpan cloth (gingham).

Oxford cloth.

Poplin.

The qualities of materials not nationally known should be subjected to certain tests. The department of home economics in any school or college is equipped to do this. Recently the University of Alabama made a comparative study of gymnasium suits, the results of which are given below:

"Type of Fabric Used in the Suits.—The fabric used in gymnasium suits in the study is a firm white cotton material similar to Indian Head. The weave is plain, and in appearance the three materials seem exactly alike.

"Abbreviations.—

- A*.....First Company
B.....Second Company
C.....Third Company

"Pattern and Cut.—In comparison with the other suits, the *A* suit is cut longer in the waist and shorter in the legs. The line from the waist to the hem forms a convex curve which allows for greater width through the hips. The *B* suit is cut straight across at the waist line in contrast with the other two suits which are slightly curved. It is cut straight from the waist to the hem which causes it to be more narrow through the hips. The openings on the *C* suits are on both shoulders rather than on the left shoulder and under the left arm as the other two suits. This suit is cut out at a slant from the waist to the hem.

"Measurements.—Although all the suits are marked size thirty-four, the differences in measurements are here noted:

	<i>A suit</i>	<i>B suit</i>	<i>C suit</i>
Bust	36½	39½	35½
Hips	45½	42	41
Waist	37	39¼	35
Length	32¾	33¾	32
Armhole	17¾	15¼	16¼
Length of Crotch	30¾	30¾	30½
Width of Leg	29	25½	29½
Width of Shoulders	18¼	19	18¼

"Thickness.—The thickness of the material was tested by the use of the micrometer. Ten trials were taken and the average recorded as follows:

"Thickness in thousandths of an inch:

- A*.....11.4
B.....9.7
C.....13.2

"Rating according to thickness:

- C*.....3 points
A.....2 points
B.....1 point

"Thread Count.—In order to determine the shrinkage of the material, the warp and woof thread count were taken. The number of warp threads per inch was taken in five places on the material and the number of woof threads per inch in five places. Each was then averaged.

"Results before laundering:

	<i>Warp</i>	<i>Woof</i>
<i>A</i>	45.3	49.4
<i>B</i>	46.7	51.1
<i>C</i>	48.5	55.04

"Results after laundering:

	<i>Warp</i>	<i>Woof</i>
<i>A</i>	48	47
<i>B</i>	50	55
<i>C</i>	54¼	49

"Rating according to least change in thread counts after laundering:

1. *A*.....3 points
 2. *B*.....2 points
 3. *C*.....1 point

"Weight and Sizing.—Because of the lack of material with which to work, I was unable to make a test for weight and sizing. However, in previous tests made, the materials were not found to be heavily weighted and I was not conscious of any apparent sizing while working with the materials.

"Tensile Strength.—In order to test the strength of the material, the tensile strength was measured. This was done by using samples of the material six inches by four inches in size. Five specimens each were used for warp and woof testing and the results averaged. The tests were made both before and after laundering.

"Before laundering:

	Warp	Woof
A.....	103.7	101.8
B.....	99.3	86.2
C.....	109.9	101.2

"After laundering:

	Warp	Woof
A.....	96.5	76
B.....	83.5	95
C.....	97	83

"Rating according to highest tensile and least difference in warp and woof strength:

1. A..... 3 points
2. C..... 2 points
3. B..... 1 point

"Laundering.—In laundering the three samples of material, two teaspoonsful of Ivory Soap Flakes were used to one quart of water. The samples were rinsed three times, dried at room temperature, and pressed without stretching or pulling.

"Conclusions.—In each of the tests made, the sample which rated first was given three points; the second, two; and the third, one point. The total points give the following results:

1. A..... 11 points
2. C..... 7 points
3. B..... 6 points

"Recommendations.—With these results at hand, the A suit is recommended."

Such wide variations indicate the need of rigid specifications by departments of physical education in order to insure quality and uniformity. Below are the specifications of the City of Detroit concerning material for the physical education suit.⁵

"Material: The suit shall be made of cotton suiting such as Pepperell Suiting, Indian Head, or other nationally known cloth, provided, however, that the said cloth fulfills the requirements as set forth hereinafter.

a) "Suiting must be woven in 40" gray and shall be finished during the finishing and dyeing process to 35—36 before cutting.

b) "Both warp and filling shall be long staple hard twisted yarn and shall count not less than 40 x 48 and shall be of a weight not less than 2.85.

c) "The suiting shall not be filled nor contain starch or any other foreign substance.

d) "The suiting shall be dyed with vat dyes and shall be guaranteed to be fast color to all ordinary tests (to sun, perspiration, and boiling).

⁵ Laurentine Collins, Specifications for Physical Education Uniforms, City of Detroit, Michigan.

e) "The cloth used shall be identified by the mill label in the neck of each garment, which label shall also provide a space for the name of the owner of the suit."

b) Cotton Material for the Bathing Suit.—The following quotation from a manufacturer of cotton bathing suits indicates standards in material for the cotton bathing suit.

"The material we use is made from what we call a two-ply combed yarn, in which the process is to comb out the short fibres in the cotton from the raw staple. This is spun into yarn and then we double it, that is, make it two-ply. Our yarn is all two-ply, combed yarn, instead of the single yarn which many manufacturers use, which is not combed but carded. The ordinary singles yarn does not seem to hold its shape."

Since the use of vat dyes makes it possible to guarantee fast colors, it is no longer necessary to use the gray suit exclusively. Manufacturers can now make the colored suits and issue a guarantee that the color will be fast under all ordinary conditions.

c) Wool Material for Athletic Wear.—Standards for wool are given below:

a) "Wool material should feel warm to the touch. It should be soft, not harsh and rough; it should not wrinkle when squeezed tightly, but should spring back into shape.

b) "The weave should be firm and even. The twill weave is usually a better wearing material, although each type of construction has its advantages. Of two otherwise similar fabrics, the one having the greatest number of threads to the inch is preferable.

c) "The warp and filling threads should run straight and even, at right angles to each other. The threads should not separate easily or the goods may pull at the seams. The warp and filling threads may be raveled out to see the quality of the yarn; a tightly twisted yarn is usually more durable."⁶

6. *Construction*.—The life of a suit depends not only upon the material used in the suit but on the attention to many details of construction. Below is a list of such details as are considered important for the construction of a good athletic costume.

a) *Facings*.—Facings are used to accentuate style, for reinforcement, and to finish. Facings should be made of the same material as the suit and cut on the bias or fitted.

b) *Seams*.—In order that seams withstand strain, they should be at least double felled. (This does not apply to facings.)

c) *Sewing*.—The suit should be sewed with a short stitch. Not less than ten stitches to the inch. No raw seams should show on inside of the suit.

d) *Darts* should be used to insure the fit of the garment over the bust.

e) *Placket*.—The placket should be at least $\frac{3}{4}$ of an inch in width and concealed. It should be securely fastened at the lower end.

f) *Pockets*.—(1) *Patch Pocket*. The pocket should have an opening

⁶ McGowan and Waite, *Textiles and Clothing*. New York: Macmillan Co.

of at least 4 inches and a depth of at least five inches. (2) Invisible Pocket. The invisible pocket should be placed on the right side of the bloomers with an opening large enough to let the hand slip in and out easily. This pocket should be of the same material as the suit. All seams should be finished.

g) Strain Points.—All strain points should be bartacked (such as ends of the pocket, bottom of the placket, or the opening of the suit).

h) Buttons.—Buttons should be of such composition that they will not split or break and will withstand boiling and all laundering processes.

i) Belt and Belt Loops.—The belt should be held in place by belt loops of the same material as the suit, which should be secured by a double row of stitching at the top and bottom.

j) Elastic.—Boil-proof elastic should be used.

k) Neck.—The "V" of the neck should be reinforced by woven tape sewed in the neck angle.

Further construction details as set forth by the Department of Physical Education, City of Detroit, which are worthy of note follow:

"Type (a) romper suit shall have the front and the back each cut in one piece and shall have a 'saddle' inserted in the crotch to insure fullness.

"Type (b) tailored bloomer suit shall have the front and the back of the top each cut in one piece and each leg of the bloomer cut in two pieces. The waist line in the front of the garment shall be curved to insure fit."

It is difficult to purchase suits by size only, because of the many types and variations in physiological development. Some companies have established three classes, short, medium, and tall, and make sizes for each of these. The most satisfactory method of insuring proper fit which the committee has found, is the scheme presented in the specifications of the City of Detroit⁷ which follows:

"The suits shall be made in sizes six to twenty-two years inclusive, and shall be sized and graded according to the average physiological development of girls between those ages. The suits shall allow ample room and freedom for all exercises and shall follow the scale hereinafter indicated. The trunk circumference is that measurement taken from the point where the neck meets the shoulder, down the front, through the crotch and up the back to the starting point. This measurement is taken over the ordinary street clothes, the tape being drawn fairly tight.

ROMPER TYPE GYMNASIUM SUIT

<i>If Trunk Circumference is</i>	<i>Size</i>
up to 46½ inches.....	6
47½ to 49 inches.....	8
49½ to 53 inches.....	10
53½ to 56 inches.....	12
56½ to 59½ inches.....	14
60 to 63½ inches.....	16
64 to 68 inches.....	18
68½ to 72½ inches.....	20
73 to 77 inches.....	22

⁷ Laurentine Collins, *Op. Cit.* p. 1.

TAILORED BLOOMER GYMNASIUM SUIT

<i>If Trunk Circumference is</i>	<i>Size</i>	<i>If Chest or Hips^s Do Not Exceed</i>
up to 47½ inches.....	6	28½ inches
48 to 50½ inches.....	8	30 inches
51 to 55 inches.....	10	31½ inches
55½ to 58½ inches.....	12	33 inches
59 to 62 inches.....	14	34½ inches
62½ to 66 inches.....	16	36½ inches
66½ to 70 inches.....	18	38½ inches
70½ to 72½ inches.....	20	40½ inches
73 to 75 inches.....	22	42½ inches

GUARANTEE

It was found that manufacturers vary in the guarantee which they are willing to give. The best guarantee found was as follows:

"Colors guaranteed absolutely fast. Suits are guaranteed not to rip or tear at seam or strain points during the life of the suits."

Other guarantees were as follows:

"We replace suits within a reasonable length of time if they do not wear satisfactorily because of flaw in material or construction."

"Absolute satisfaction."

"We guarantee our suits for two years."

"We expect our suits to give entire satisfaction."

The guarantee obtained by Detroit is as follows:

"The manufacturer shall guarantee the suits not to rip or tear at a seam or strain point during the life of the suit and shall further guarantee the colors to be absolutely fast. He shall agree that in the event of failure of any of the points hereinbefore stated to replace the suit to the purchaser without cost."⁹

CONCLUSION

Costumes will ever be of vital interest and importance to women. Experience has shown that our physical education costumes are not an exception. To be satisfactory certain standards and requirements must be met. The costumes should conform to the fashions of the day, they should be feminine in style, and should be becoming to the wearer. It is equally important that they fit the wearer, that they be comfortable, hygienic, and adapted to the purpose which they must serve. The question of durability, ease of laundering, and adaptability to the price range of the group must also be given due consideration when planning the costumes for physical education classes.

It is well to bear in mind that we must keep pace with the changing world in gymnasium costumes as well as in all phases of life. Experimentation must go on, and our costumes must be changed as new and better styles are discovered.

^s *Ibid.*, p. 2.

⁹ *Ibid.*, p. 2.

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Committee Report on Gymnasium and Athletic Field Equipment

By CARL H. BURKHARDT, *Chairman*

INTRODUCTION

IN PREPARING this report on gymnasium and athletic field equipment, your Committee has attempted to bring together in convenient form a tabulation of items necessary in the management of physical education activities. It is also hoped that this report will serve as a guide to workers in the field of physical education in selecting such equipment which has a definite relation to specific activities.

This report also deals with play areas for games and sports; but does not include the construction of indoor gymnasium and outdoor athletic or playground facilities.

The Committee has not attempted to set up standards for equipment or supplies, etc., based upon pupil membership, but is simply furnishing a list of activities with its necessary working tools from which choices may be made. The quantity of material involved in any one of the listed activities is based upon a single unit plan.

All equipment is classified under three heads as follows:

- a) Field or Floor Equipment
- b) Players' Equipment
- c) Official's Equipment

For this report the following activities have been selected. Many more activities may be added:

Archery	Golf (Indoor)	Quoits
Badminton	Golf (Outdoor)	Shuffle Board
Baseball (Regulation)	Gymnastics	Soccer
Baseball (Indoor)	Handball	Speedball
Baseball (Playground)	Hitball	Sprintball
Basketball (Boys and Girls)	Hockey (Field)	Squash
	Hockey (Ice)	Swimming (Pool)
Beeball	Horseshoes	Tennis
(Modified Football)	Lacrosse	Tetherball
Captainball	Lawn Bowls	Touchdown Passball
Cricket	Paddle Tennis	Track and Field Athletics
Deck Tennis	Pinball	Volleyball
Fieldball		Water Polo
Football		

The third draft of the Gymnasium and Athletic Field Equipment Report was presented at the Annual Convention of the American Physical Education Association at Cleveland, Ohio, April 18-21, and accepted at the Public School Section meeting.

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GYMNASIUM AND ATHLETIC FIELD EQUIPMENT

ARCHERY

- a) *Field Equipment* (Outdoor and Indoor)
 1. Archery Target
 2. Archery Target Stand
 3. Extra Faces
 4. Backstop—
 - Indoor—Felt Curtain
 - Outdoor—Celotex Wall-board
 5. Marked Court—Outdoor
Lime Marker and Lime
 6. Measuring Tape
- b) *Players' Equipment*
 1. Bows
 2. Arrows
 3. Finger-Tip Gloves or Shooting Tab
 4. Arm Gauntlets
 5. Quivers
 - Indoor—Wooden
 - Outdoor—Ground Quivers
heavy iron wire
 6. Suitable sport costume
- c) *Official's Equipment*
 1. Rulebook
 2. Clip Boards
 3. Scorebook

1. Badminton Posts
2. Badminton Net
- b) *Players' Equipment*
 1. Badminton Rackets
 2. Badminton Racket Presses
 3. Badminton Shuttlecocks
 4. Suitable Gymnasium Costume
- c) *Official's Equipment*
 1. Whistle
 2. Rulebook
 3. Score Pad

BASEBALL

- a) *Field Equipment*
 1. Bases, Home Plate, and Pitcher's Plate
 2. Line Marker
 3. Lime
 4. Tape Measure
 5. Foul-Line Flags
 6. Screen Backstop
 7. Scoreboard
 8. Player Benches
- b) *Players' Equipment*
 1. Baseball
 2. Catcher's Mask, Chest Protector, Leg Guards, and Mitt

BADMINTON

- a) *Field Equipment* (for doubles)

3. Fielders' Gloves and First Baseman's Mitt

4. Bats

5. Uniforms (not essential)

(a) Shirt (not essential)

(b) Pants and Belt (not essential)

(c) Cap (not essential)

(d) Socks (not essential)

(e) Athletic Supporter (desirable)

(f) Shoes with Spikes

6. Book of Rules

c) *Official's Equipment*

1. Mask, Chest Protector, and Leg Guards

2. Indicator

3. Book of Rules

4. Scorebook

5. Umpire's Cap and Dark Suit

BASEBALL (INDOOR)

a) *Floor Equipment*

1. Measuring Tape

2. Base Lines, Bases, and Pitcher's Box marked on floor

b) *Players' Equipment*

1. Smooth-seam indoor baseball (12- or 14-inch)

2. Indoor Baseball Bats

3. Book of Rules

4. Suitable Gymnasium Costume

c) *Official's Equipment*

1. Indicator

2. Book of Rules

3. Scorebook

BASEBALL (PLAYGROUND)

a) *Field Equipment*

1. Bases, Home Plate, and Pitcher's Plate

2. Tape Measure

3. Line Marker

4. Lime

5. Foul-Line Flags

6. Screen Backstop

b) *Players' Equipment*

1. Playground Baseball (Smooth or outseam—12- or 14-inch)

2. Playground Bats

3. Book of Rules

4. Suitable Athletic Costume

c) *Official's Equipment*

1. Indicator

2. Book of Rules

3. Scorebook

BASKETBALL

a) *Floor Equipment*

1. Basketball Backboard (1 pair)

2. Iron Basketball Goals

3. Cotton Twine Nets

4. Floor Striped (Basketball Court)

5. Basketball Pump

6. Basketball Laces (Rawhide)

7. Basketball Air Gauges

8. Player's Bench and Table for Officials

b) *Players' Equipment*

1. Basketball

2. Uniforms (desirable)

3. Rulebook

c) *Official's Equipment*

1. Basketball Whistles of Distinctive Tones

2. Scorebook

3. Basketball Timer

4. Rulebook

BEEBALL—(Modified Football)

a) *Field Equipment*

1. Pair of Goal Posts with Cross Bar

2. Line Marker

3. Lime

4. Beeball (similar to a soccerball)

5. Scoreboard

6. Players' Bench

b) *Players' Equipment*

No Special Uniform Required, except that *one* team wear same distinguishing mark.

c) *Official's Equipment*

1. Whistle

2. Timer

3. Book of Rules

CAPTAINBALL

a) *Floor Equipment*

1. Bases

2. Zone, floor markings

b) *Players' Equipment*

1. Basketball or other Ball

2. Rulebook

3. Suitable gymnasium costume

- c) *Official's Equipment*
 - 1. Whistle
 - 2. Timer (Watch)
 - 3. Rulebook
 - 4. Score Pad
 - 5. Colored Bands, for distinguishing players

CRICKET

- a) *Field Equipment*
 - 1. Wickets
- b) *Players' Equipment*
 - 1. Cricket Ball
 - 2. Cricket Bats
 - 3. Leg Guards for Batsman
 - 4. Gloves for Batsman
 - 5. Leg Guards for Wicket Keeper
 - 6. Gloves for Wicket Keeper
 - 7. Uniform
- c) *Official's Equipment*
 - 1. Scorebook
 - 2. Rulebook

DECK TENNIS

- a) *Field Equipment*
 - 1. Deck Tennis Ring—made of sponge rubber
 - 2. Deck Tennis Net, size 20 ft. x 1½ ft.
 - 3. Deck Tennis Posts with Guy Ropes
- b) *Players' Equipment*
 - No Special Equipment Required by Players
- c) *Official's Equipment*
 - 1. Whistle
 - 2. Copy of Rules
 - 3. Score Pad

FIELDBALL

- a) *Field Equipment*
 - 1. Goals
 - 2. Line Marker
 - 3. Lime
 - 4. Tape Measure
 - 5. Inflator
- b) *Players' Equipment*
 - 1. Soccerball
 - 2. Uniform
- c) *Official's Equipment*
 - 1. Whistle for Referee
 - 2. Horn for Timer and Scorer
 - 3. Timer

- 4. Rules
- 5. Score Sheets
- 6. Clip Boards

FOOTBALL

- a) *Field Equipment*
 - 1. Goals
 - 2. Line Marker
 - 3. Lime
 - 4. Lineman's Measuring Outfit
 - 5. Yard Line Markers
 - 6. Scoreboard
 - 7. First-Aid Supplies
 - 8. Ball Inflator
 - 9. Air Gauge
 - 10. Player Benches
- b) *Players' Equipment*
 - 1. Football
 - 2. Uniforms (for protection)
 - (a) Pants (including Knee, Thigh, and Hip Pads)
 - (b) Jersey
 - (c) Head Guard
 - (d) Shoulder Pads
 - (e) Shoes
 - (f) Athletic Supporter
 - 3. Book of Rules
- c) *Official's Equipment*
 - 1. Horns and Whistles of Distinctive Tone for Each Official
 - 2. Football Timer
 - 3. Book of Rules
 - 4. Scorebook

GOLF (INDOOR)

- a) *Field Equipment*
 - 1. Driving Net 9' x 10' x 20', consisting of back drop of canvas and netting at sides and top
 - 2. Rubber Stance Mat
 - 3. Cocoa Mat
 - 4. Putting Carpet
 - 5. Putting Disc
- b) *Players' Equipment*
 - 1. The usual clubs for golf. Should have both wood and iron clubs and extra putters. Include weights suitable for both men and women, and one set of left-handed clubs.
 - 2. Several dozen standard golf balls—practice grade

- | | |
|---|--|
| 3. Suitable Gymnasium Costume
c) <i>Official's Equipment</i>
1. Score Card
GOLF (OUTDOOR)
a) <i>Field Equipment</i>
1. Putting Cups
2. Flag Poles
3. Flags
4. Tee Marker
b) <i>Players' Equipment</i>
1. Golf Bag | 2. Driver, Brassie, or Spoon
3. Putter
4. Mid Iron
5. Mashie
6. Niblick
7. Golf Balls
8. Package of Tees
9. Score Card and Pencil
10. Sport Clothes
11. Golf Shoes
c) <i>Official's Equipment</i>
1. Score Card |
|---|--|

GYMNASTICS

a) *Floor, Wall, Suspended, and Movable Equipment*

*Maximum Number of
Pupils Per Unit
at One Time*

1. Balance Board	10
2. Bar, Horizontal and Vaulting	10
3. Baseball (Indoor)	10
4. Basketball	10
5. Basketball Backstop (1 pair)	12-20
6. Basketball Goal (1 pair)	12-20
7. Bat (Indoor)	8
8. Bean Bag	2
9. Boom with Boom Saddle	10
10. Buck	10
11. Bulletin Board	1
12. Black Board	1
13. Boxing Gloves (2 sets for demonstrating)	
14. Cabinet for Games Equipment	40
15. Cabinet, Indian Club	40
16. Cross Bar—1 doz.....	For any reasonable number
17. Dividing Net	60
18. First-Aid Cabinet	For any reasonable number
19. Flying Rings (1 pair)	8
20. Giant Stride (6 to 8 rope ladders)	48
21. Horse	10
22. Hurdle (Adjustable)	5
23. Indian Clubs (1 pair)	1
24. Instructor's Platform	Unlimited
25. Jumping Board	10
26. Jumping Standard (1 pair)	20
27. Jumping Mat (corrugated rubber)	20
28. Ladder, Adjustable with Foot Stand	10
29. Ladder, Swedish	20
30. Mat	10
31. Mat Covers	10
32. Mat Hangers (1 pair for every four mats)	
33. Medicine Ball	10

34. Measuring and Testing Apparatus
- Anthropometric Cabinet
 - Adjustable Horizontal Bar
 - Adjustable Suspended Rings
 - Dynamometer for Back and Legs
 - Dynamometer Base
 - Manuometer
 - Platform Scale
 - Stadiometer
 - Tape, five feet, Metric and Inches
 - Wall Parallel
 - Wet Spirometer
 - Wood or Glass Mouth Pieces (500 or more)
- Special Equipment (Individual Health Training)
- Abdominal Table
 - Benches—6 ft. long and 15 inches high
 - Balance Board
 - Black Board, 4' x 10'
 - Mats, 2" x 4' x 6' (at least four)
 - Mirror, 4' x 6'
 - Marbles
 - Penholders
 - Plinth (Leather Covered)
 - Pedograph Machine (for making footprints)
 - Phonaudiometer (for ear testing)
 - Stools (at least two)
 - Silhouettegraph (for posture prints)
 - Snellen E Chart—with artificial lighting
(for eye test)
 - Stall Bars (at least three sections)
- | | |
|--|---------------------------|
| 35. Parallel Bars | 10 |
| 36. Portable Bleacher—based on 16 ft. standard length—
2-tier—accommodates 22 spectators.
Add 10 persons to every additional tier. | |
| 37. Pole (Climbing) | 6 |
| 38. Potato Race Receptacles (1 pair) | 10 |
| 39. Rope, Climbing | 6 |
| 40. Shot (Indoor) | 10 |
| 41. Stall Bar with Bench | 6 |
| 42. Toe Block (Shot Put) | 10 |
| 43. Tug-of-War Rope | 14 |
| 44. Volleyball | 10 |
| 45. Volleyball Net | 18 |
| 46. Volleyball Standards (1 pair) | 18 |
| 47. Wand | 1 |
| 48. Wand Box | 50 |
| 49. Wrestling Mat | For any reasonable number |
- b) *Pupils' Equipment*
- 1. Gymnasium Shoes
 - 2. Gymnasium Costume—for all pupils
above primary grades

c) *Teacher's Equipment*

OFFICE

1. Desk
2. Chairs
3. Filing Cabinet
4. Book Case
5. Storage Cabinet
6. Clothes Locker
7. Lavatory
8. Toilet
9. Shower
10. Mirror
11. First-Aid Cabinet and Supplies
12. Couch
13. Suitable Gymnasium Costume

MISCELLANEOUS

1. Uniform
2. Whistles
3. Stop Watch
4. Tape Measure
5. Athletic and Game Library
6. Professional Reference Library
7. Colored Bands (for distinguishing players)
8. Inflaters
9. Lacing Needles and Raw-hide Laces
10. Repair Kit
11. Piano
12. Victrola
13. Clip Boards

HANDBALL

- a) *Field Equipment*
 1. Back Stop
 2. Marked Court
- b) *Players' Equipment*
 1. Handball
 2. Handball Gloves
 3. Suitable Costume
- c) *Official's Equipment*
 1. Score Sheets
 2. Clip Boards

HITBALL

- a) *Field Equipment*
 1. Line Marker
 2. Lime
 3. Tape
 4. (3) Bases (home plate and pitcher's plate)
 5. Inflater
- b) *Players' Equipment*
 1. Soccerball

2. Uniforms

c) *Official's Equipment*

1. Whistle
2. Clip Board
3. Score Sheets
4. Rules

HOCKEY (FIELD)

a) *Field Equipment*

1. Goals
- b) *Players' Equipment*
(for two teams)
 1. Field Hockey Ball
 2. Field Hockey Sticks
 3. Goal Keepers Leg Guards
 4. Shin Guards
 5. Uniform

c) *Official's Equipment*

1. Whistles of distinctive tone
2. Timer
3. Rulebook
4. Scorebook

HOCKEY (ICE)

a) *Field Equipment*

1. Goals and Nets
2. Sheet of Smooth Ice
3. Solid Board Wall, 3 to 4 feet high entirely surrounding playing surface
4. Penalty Box
5. Blueing or Paint, to mark zone lines

b) *Players' Equipment*

1. Puck
2. Hockey Sticks and Goal Stick
3. Shoes and Skates
4. Uniform (for protection)
 - (a) Jersey } with pads
 - (b) Pants }
 - (c) Long Stockings
 - (d) Shin Guards
 - (e) Hockey Gloves
 - (f) Body Protector and Leg Pads for Goalie
5. Book of Rules

c) *Official's Equipment*

1. Whistle or Horn, of distinctive tone for each official
2. Shoes and Skates
3. Timer
4. Gong
5. Book of Rules
6. Scorebook

HORSESHOES

- a) *Field Equipment*
 - 1. Pitching Boxes (clay fill)
 - 2. Iron Stakes
- b) *Players' Equipment*
 - 1. Set of Horse Shoes
- c) *Official's Equipment*
 - 1. Measuring Rule (caliper)
 - 2. Rulebook

LACROSSE

- a) *Field Equipment*
 - 1. Goals and Nets
- b) *Players' Equipment*
 - 1. Lacrosse Goal Sticks
 - 2. Lacrosse Defense Sticks
 - 3. Lacrosse Attack Sticks
 - 4. Gloves
 - 5. Shoulder and Arm Pads
 - 6. Helmets or Caps
 - 7. Uniform
- c) *Official's Equipment*
 - 1. Whistles, of distinctive tone
 - 2. Timer
 - 3. Rulebook
 - 4. Scorebook

LAWN BOWLS

- a) *Field Equipment*
 - 1. "Jack" or "Kitty"—a white porcelain ball about $2\frac{1}{2}$ inches in diameter
 - 2. Corrugated Rubber Mat, 22 inches long by 14 inches wide
- b) *Players' Equipment*
 - 1. Eight Bowls (for a team of four players)

Note: Bowls are made of Lignum Vitae (Wood) size $16\frac{1}{2}$ inches in circumference and about $3\frac{1}{2}$ pounds in weight
- c) *Official's Equipment*
 - 1. Rulebook
 - 2. Score Pad

PADDLE TENNIS

- a) *Field Equipment*
 - 1. Posts
 - 2. Dividing Net
 - 3. Paddles
 - 4. Marked Court
- b) *Players' Equipment*
 - 1. Tennis Balls or Rubber Balls

- 2. Suitable Gymnasium Costume

- c) *Official's Equipment*
 - 1. Score Pads

PINBALL

- a) *Field Equipment*
 - 1. Line Marker
 - 2. Lime
 - 3. Tape Measure
 - 4. Two Indian Clubs or two ten pins
- b) *Players' Equipment*
 - 1. Soccerball
 - 2. Uniform
- c) *Official's Equipment*
 - 1. Whistle—Horn
 - 2. Timer
 - 3. Rules
 - 4. Score Sheets
 - 5. Clip Boards

QUOITS

- a) *Field Equipment*
 - 1. Quoits Pits } Outdoor Games
 - 2. Iron Stakes } Games
 - 3. Indoor Quoit Pins—Indoor Games
- b) *Players' Equipment*
 - 1. Set (4) Iron Quoits—Outdoor
 - 2. Set of Rubber Quoits—Outdoor and Indoor
- c) *Official's Equipment*
 - 1. Official Measuring Rule (caliper)
 - 2. Rulebook
 - 3. Score Sheets

SHUFFLEBOARD

- a) *Floor Equipment*
 - 1. Four Cues
 - 2. Eight Discs
 - 3. Court Markings
- b) *Players' Equipment*
 - 1. Suitable Sport Costume
- c) *Official's Equipment*
 - 1. Copy of the Rules
 - 2. Score Pad

SOCCER

- a) *Field Equipment*
 - 1. Soccer Goals
 - 2. Line Marker
 - 3. Lime
 - 4. Tape Measure
 - 5. Inflator
 - 6. Lacing Needle

b) *Players' Equipment*

1. Soccerball
2. Uniform
 - (a) Jersey, Pants, Socks
 - (b) Shoes and Athletic Supporter (desirable)
3. Book of Rules

c) *Official's Equipment*

1. Horn or Whistle, of distinctive tone for each official
2. Timer
3. Book of Rules
4. Scorebook

SPEEDBALL

a) *Field Equipment*

1. Goal Posts (Same as for Football)
2. Line Marker
3. Lime
4. Score Board
5. First-Aid Supplies
6. Ball Inflator

b) *Players' Equipment*

1. Soccerball, or any other round, leather-covered ball 28 to 30 inches in circumference
2. Uniforms (for protection)
 - (a) Jersey
 - (b) Pants
 - (c) Cleated Shoes (no steel spikes)

c) *Official's Equipment*

1. Horns and Whistles
2. Timer
3. Book of Rules
4. Scorebook

SPRINTBALL

a) *Field Equipment*

1. Line Marker
2. Lime
3. Tape Measure
4. Inflator
5. One Home Plate
6. One Pitcher's Plate

b) *Players' Equipment*

1. Soccerball
2. Uniforms

c) *Official's Equipment*

1. Whistle
2. Rules
3. Score Sheets
4. Clip Board

SQUASH

a) *Floor Equipment*

None

b) *Players' Equipment*

1. Squash Racquets
2. Squash Racquet Balls
3. Athletic Costume

c) *Official's Equipment*

1. Rulebook
2. Score Pad

SWIMMING (POOL)

a) *Pool Equipment*

1. Bamboo Rescue Pole
2. Drinking Fountain
3. First-Aid Kit
4. Inhalator
5. Kicking Boards, size 8" x 48" (at least six)
6. Life Buoy, 14", complete with rope
7. Portable Bleachers—if permanent seating facilities are not provided
8. Ropes, with wooden or cork bobbars for swimming lanes (and beginners' areas)
9. Rubber Disks, for practice in retrieving objects (at least four)
10. Springboard—1 meter
11. Springboard—3 meter
12. Steel (white enameled) table (one)
13. Steel Chairs (at least two)
14. Score Board, 40" x 54"
15. Ten-Pound Rubber Brick, for practice in retrieving
16. Thermometer
17. Water Polo Balls (2)
18. Water Polo Goals (1 pair)

Special for Life Saving

- | | | |
|------------------------------------|---|-------|
| 1. 1 dozen pair White Canvas Shoes | } | Women |
| 2. 1 dozen White Blouses | | |
| 3. 1 dozen White Skirts | | |
| 4. 1 dozen pair White Canvas Shoes | } | Men |
| 5. 1 dozen White Coats | | |
| 6. 1 dozen White Pants | | |

b) Students' Equipment

1. Bath Robes or Toga Robes
2. Cotton Suits for Girls and Women
3. Rubber Bathing Caps
4. Rubber, Wooden, or Paper Shoes (Sandals)
5. Swimming Suits for Boys and Men, to be used in contests and on visitors' days only
6. Towels

c) Official's Equipment

1. Cartridges
2. Clip Boards
3. Chalk for Score Board
4. Diving Chart with "Ready Reckoner" for Scoring Dives
5. Entry Blanks for Meets, providing place for best performance of each entry and place for member's name and value of each dive
6. Numbered Cards for Contestants (purpose, draw for starting positions)
7. Rulebook—Intercollegiate and A.A.U.
8. Rubber, Wooden, or Paper Shoes
9. Starter's Pistol—Small caliber
10. Stop Watches
11. Score Sheets
12. Small Cards, with pool records listed for ready references, for announcer
13. Three (3) sets of Cards, numbered from 0 to 10 (sizes $8\frac{1}{2}$ " x 11") for judges to be used in diving contests
14. White Sport Shirt
15. White Duck Trousers
16. Whistles

TENNIS*a) Field Equipment*

1. Screen Backstops
2. Posts for Net—complete with reel
3. Tennis Net
4. Measuring Tape
5. Line Marker
6. Lime

or Regulation Tapes for Lines

b) Players' Equipment

1. Tennis Balls
2. Rackets
3. Shoes
4. Book of Rules
5. Sport Costume

c) Official's Equipment

1. Whistle
2. Book of Rules
3. Score Pad

TETHERBALL*a) Field Equipment*

1. Pole Set in Concrete or Tetherball Standard
2. Tetherball
3. Cord
4. Dividing Line

b) Players' Equipment

1. Tennis Rackets or Paddles
2. Sport Costume

c) Official's Equipment

1. Score Sheets

TOUCHDOWN-PASSBALL*a) Field Equipment*

1. Line Marker
2. Lime
3. Tape Measure
4. Inflator

b) *Players' Equipment*

1. Soccerball
2. Uniform

c) *Official's Equipment*

1. Whistle
2. Timer
3. Rules
4. Score Sheet
5. Clip Board

TRACK AND FIELD ATHLETICS

a) *Field Equipment*

1. Scorer's Table with Chairs
2. Contestants' Numbers and Safety Pins
3. Officials' Badges
4. Scales for Weighing
5. Stadiometer
6. Steel Tapes, 50 to 100 feet in length
7. Stop Watches
8. Starter's Pistol and Cart-ridges
9. Megaphone
10. Scoreboards, Score Cards, Clerk-of-Course Cards, and Record Cards
11. Official Rulebook
12. Whistles
13. Score Boards with Thumb Tacks
14. Yarn to Mark Finish Line
15. Kelly Pool Balls to be Used for Drawing Lanes
16. Wooden Hoe to Fill up Starting Holes

Shot-Put

1. Hinged Strap-Iron Circle, 7' Circumference
2. Toe Board
3. Steel Measuring Tape
4. 8-lb., 12-lb., and 16-lb. Shots

Discus Throw

1. Hinged Strap-Iron Circle, 7' Circumference
2. 8-10 Markers, to indicate each 10-foot distance above 100 feet
3. Steel Measuring Tape
4. Discus

Hammer Throw

1. Hinged Strap-Iron Circle, 7' Circumference
2. Markers, to indicate sectors within which hammer should fall

3. Hammers

4. Extra Hammer Handles
5. Measuring Tape

Javelin Throw

1. Scratch Line, with lines extended
2. 15-foot Balk Line
3. Markers, to indicate each 10-foot distance beyond 125 feet
4. Steel Measuring Tape
5. Javelin

Broad Jump

1. Jumping Pit
2. Take-off Board
3. Balk Line Markings
4. Three-foot Markers, at side of approach runway
5. Rake, for leveling surface of pit
6. Steel Measuring Tape
7. Spade

High Jump

1. High Jump Pit
2. 15-foot Balk Line
3. Jump Standards
4. Cross-Bars—bamboo or hickory
5. Spade
6. Rake
7. Measuring Rod

Pole Vault

1. Pole Vaulting Pit
2. Approach Runway
3. Balk Line Markings
4. Adjustable Pole-Vault Standards
5. Cross-Bars
6. Forked Stick, 6' long to replace cross-bar
7. Vaulting Poles
8. Spade
9. Rake
10. Measuring Rod
11. Three-foot Markers, beside approach runway
12. Take-off Trough

Track Events

1. Starting Lines and Finish Lines
2. Touch-off Zones
3. Hurdle Markers
4. Distance Markers
5. Competitors' Lanes
6. Adjustable Hurdles
7. Finish Posts
8. Judges' Platform
9. Relay Batons
10. Worsted Yarn
11. Measuring Tape

12. Competitors' Numerals (for track and field events)

13. Track Meet Scorebook

b) *Students' Equipment*

1. Appropriate Athletic Costume, including track shoes
2. Sweat Shirt and Training Pants

c) *Official's Equipment*

1. Rulebook
 2. Clip Boards and Whistle
- Note—Other necessary equipment, consult separate events

VOLLEYBALL

a) *Field Equipment*

1. Volleyball Net
2. Volleyball Standards—or—
3. Volleyball Cleats, fastened to side of walls

b) *Players' Equipment*

1. Volleyball
2. Rulebook
3. Suitable Gymnasium Costume

c) *Official's Equipment*

1. Referee's Whistle
2. Timer
3. Rulebook
4. Score Pad

WATER POLO

a) *Pool Equipment*

1. One Pair Water Polo Goals
2. Two Water Polo Balls
3. White Enameled Steel Table
4. Two Steel Chairs
5. First-Aid Kit
6. Score Board (fastened to wall)
7. Gong—8 inch
8. Rescue Pole
9. Portable Bleachers—if permanent are not available

b) *Player's Equipment*

1. Bathing Caps—Two Colors
2. Water Polo Trunks, for men including supporters
3. Towels
4. Bath Robes and Toga Robes
5. Ear Plugs
6. Rubber, Wooden, or Paper Shoes

c) *Official's Equipment*

1. Game Watch (two)
2. Whistles
3. Score Sheets
4. Clip Boards
5. Rulebook
6. Rubber, Wooden, or Paper Shoes

A Comparative Study of the Effects of the Financial Depression on Certain Vocational Aspects of College Physical Education

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The Rice Institute,
Houston, Texas*

IN 1928 a personnel study of directors of physical education for men in colleges and universities¹ was conducted under the sponsorship of the College Physical Education Association (then the Society of Directors of Physical Education in Colleges). In this study the vocational histories of 178 directors of physical education were examined and a clear-cut composite picture of the then director of physical education determined. Since 1928, however, many things have happened which might well have changed the vocational status of the director; the major destructive agency being, of course, the economic crash which occurred in the fall of 1929.

Since colleges and universities, along with other institutions, have felt the effects of this economic upheaval it is only logical to suppose that individuals employed by institutions of higher learning would likewise feel the pinch of the necessary financial readjustments. While almost everyone has personal knowledge of college physical educators who have had their salaries lowered and their duties increased, it is unscientific to generalize from these specific instances and assume that such is the case with all persons engaged in this field of endeavor. With this thought in mind the writer sent a questionnaire² to 187 members of the College Physical Education Association asking for factual information concerning the effects of the economic depression upon their salaries, supplementary incomes, faculty rank, duties, and size of staff during the five depression years, 1929 to 1933 inclusive. With this information, compared with that gained in the 1928 study, it is possible to determine what

¹ H. A. Scott, *Personnel Study of Directors of Physical Education for Men in Colleges and Universities*, New York, Bureau of Publications, Teachers College, Columbia University, 1929.

² The writer was assisted in this study by Messrs. Harry Fouke and David Furman, students at The Rice Institute.

effect, if any, the economic readjustment had upon the composite college physical educator.

Of the 187 questionnaires distributed to individuals 50.2 per cent of them were answered (Table I). This number represents 67 different institutions (Table II) in all sections of this country, and two schools in Canada. In the 1928 study, 178 institutions were represented. Of this number, 52 or 70.7 per cent (Tables II and III) participated in the 1933-1934 study.

TABLE I

Number of questionnaires sent to members of the College Physical

Education Association	187
Number of questionnaires answered	94
Per Cent	50.2

TABLE II

SCHOOLS PARTICIPATING IN THE STUDY IN 1933-1934 AND IN 1927-1928

1933-1934	1927-1928
Acadia University	No
Amherst College	Yes
University of Arizona	Yes
Bates College	Yes
Boston University	Yes
Bowdoin College	Yes
Brown University	Yes
University of Southern California	No
University of Chicago	Yes
Colby College	Yes
Columbia University	Yes
Columbia University Teachers College	No
Dartmouth College	Yes
De Pauw University	Yes
City College of Detroit	No
Drew University	No
Earlham College	Yes
Gettysburg College	Yes
Hamilton College	Yes
Haverford College	Yes
Howard University	No
University of Illinois	Yes
University of Iowa	Yes
Lafayette College	Yes
Lehigh University	No
Seth Low Junior College of Brooklyn, New York	Yes
McGill University	No
University of Maryland	No
Massachusetts Agricultural College	Yes
Miami University	Yes
University of Michigan	Yes
Michigan State Normal College	Yes
University of Minnesota	Yes
University of Missouri	Yes

TABLE II (Continued)

1933-1934	1927-1928
Muskingum College	Yes
University of New Hampshire	Yes
New York University	Yes
College of the City of New York	No
Oberlin College	Yes
Ohio State University	Yes
Ohio Wesleyan University	Yes
Pennsylvania State College	Yes
University of Pittsburgh	Yes
Rhode Island State College	Yes
The Rice Institute	No
Rochester University	No
Stanford University	Yes
State Teachers College, Bloomsburg, Pa.	No
Susquehanna University	Yes
Syracuse University	Yes
University of Texas	Yes
Tufts College	Yes
University of Virginia	Yes
Virginia Polytechnic Institute	Yes
Wabash College	Yes
University of Washington	Yes
State College of Washington	Yes
Wesleyan University	Yes
West Virginia University	Yes
West Virginia Wesleyan	Yes
College of William and Mary	Yes
Williams College	Yes
University of Wisconsin	Yes
Wittenberg College	Yes
College of Wooster	Yes
Worcester Polytechnic Institute	Yes
Y. M. C. A. College of Chicago	No

TABLE III

Total number of schools participating in 1933-1934 study	67
Total number of the group participating in 1927-1928	52
Per Cent	70.7

In compiling the data in the 1933-1934 study, the administrative heads of the department of physical education have been treated separately from those who are not heads of departments, thus giving a fair picture of teachers in the field of college physical education and health who rank below departmental heads.

In interpreting the data, the 1927-1928 group can be compared only with the group representing the heads of departments in the five years of the 1933-1934 study because in 1927-1928 only heads of departments were studied. It must be pointed out that no generalization should be attempted from these data. The facts revealed apply only to the conditions represented in the sixty-seven schools and the eighty-five (approximately) individuals involved in the study.

A comparative study of the salaries (Table IV) of the heads of departments of physical education in 1927-1928 and in 1929-1933 inclusive shows that the range of salaries in 1927-1928 was \$1,500 to \$10,000 a year, while in the five depression years the range in 1929-1930 was \$2,400 to \$8,600 and in 1933-1934 \$2,080 to \$10,000 annually. The median salary of directors in 1927-1928 was \$3,783 yearly, while in 1929-1930 it had risen to \$4,812.50, and then dropped to \$4,500 annually in 1933-1934, a loss of \$312.50 during the depression, but a net gain in 1933-1934 over 1927-1928 of \$717.

While comparative figures for those not head of the department of physical education in 1927-1928 are not available it should be noted that there has been only a comparatively small loss (\$300) in yearly salary in this group since 1929 (Table IV).

TABLE IV
SALARIES

Academic Year....	1927-1928 ³	1929-30		1930-31		1931-32		1932-33		1933-34	
	Dept. Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
Number of Cases Studied.....	178 ⁴	49	30	52	35	53	37	53	37	54	37
Range.....	\$1500 to 10000	\$2400 to 8600	\$1400 to 6250	\$2400 to 9000	\$1600 to 6250	\$2400 to 8800	\$1600 to 6250	\$2175 to 8800	\$1600 to 6000	\$2080 to 10000	\$1400 to 6000
Q ₁	\$4581	\$5925	\$4358 .50	\$5950	\$4403 .50	\$6062 .50	\$4562 .50	\$6093 .75	\$4391 .50	\$5700	\$4275
Median.....	\$3783	\$4812 .50	\$3650	\$4750	\$3650	\$4958 .33	\$3750	\$4611 .11	\$3475	\$4500	\$3350
Q ₃	\$3121	\$3696 .43	\$2462 .50	\$3678 .57	\$2475	\$3640 .63	\$2446 .50	\$3604 .17	\$2506 .25	\$3375	\$2206 .50

In considering the supplementary income (Table V) of the heads of departments in 1927-1928 and 1929-1933, the per cent of the total number of directors able to obtain summer school teaching positions did not change materially (24.3 per cent in 1927-1928 and 25.9 per cent in 1933-1934). Likewise there was no significant change in the median salary for summer school teaching (\$515 in 1927-1928 and \$500 in 1933-1934). In this connection it should be noted that in the group studied those not heads of departments were able to secure positions in summer schools to about the same extent as heads of departments and to earn almost as much money for their services. Other means of supplementing the regular yearly salary seem to be as numerous during the years 1929-1933 as in 1927-1928 and the median income about the same.

³ H. A. Scott, *Op. Cit.*

⁴ This number included sixty-nine members of the College Physical Education Association.

However, during the period 1929-1933 about 40 per cent of the heads of departments and 30 per cent of those not heads had no supplementary income. Since the figures for 1927-1928 are not available it is not known what per cent of the directors in those years had no supplementary income.

During a period of several years it is to be expected that there would be a general elevation in the faculty rank of college teachers. It is quite probable, however, that this normal rise in rank would be disrupted during a period of financial stress such as the one we have just experienced. A study of Table VI, however, reveals a steady elevation in faculty rank during each of the five depression years. In 1927-1928, 40 per cent of the heads of departments were full professors; in 1929-1930, 69 per cent had attained this rank, while in 1933-1934, 74 per cent were so rated; a net gain over 1927-1928 of 33.1 per cent. As would be supposed, while

TABLE V
SUPPLEMENTARY INCOME

Academic Year . . .	1927-1928	1929-30		1930-31		1931-32		1932-33		1933-34	
<i>Summer School Teaching</i>	Dept. Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
Number of Cases . .	43 24.3	13 26.5	11 36.6	14 26.9	15 42.8	15 28.3	15 40.5	16 30.1	12 32.4	14 25.9	9 24.3
Range		\$100 to 1333	\$200 to 800	\$100 to 1333	\$200 to 1000	\$100 to 1333	\$150 to 1000	\$100 to 1333	\$120 to 1100	\$100 to 1130	\$120 to 1200
Median	\$515	\$450	\$530	\$475	\$574	\$367	\$450	\$454	\$520	\$500	\$325
<i>Writing</i>											
Number of Cases . .	14	7		8		10	2	11	2	7	
Per Cent of Total . .	7.8	14.2		15.3		18.8	5.4	20.7	5.4	12.9	
Range		\$49 to 8000		\$50 to 8000		\$50 to 7000		\$50 to 6000		\$35 to 5000	
Median	\$376 (App.)	\$500		\$250		\$308.50	\$475	\$150	\$250	\$200	
<i>Officiating</i>											
Number of Cases . .	66	5	4	6	5	6	5	6	5	3	3
Per Cent of Total . .	37.3	10.	13.3	11.5	14.2	11.3	13.5	11.3	13.5	5.5	8.1
Range		\$250 to \$600	\$100 to \$600	\$25 to \$600	\$100 to \$600	\$30 to \$550	\$100 to \$600	\$50 to \$500	\$100 to \$600	\$100 to \$500	\$100 to \$600
Median	\$226	\$500	\$245	\$375	\$234	\$325	\$253	\$400	\$274	\$350	\$333
<i>Extension Lectures</i>											
Number of Cases . .							2		2		2
Per Cent of Total . .							5.4		5.4		5.4
Median							\$450		\$220		\$200
<i>Investments</i>											
Number of Cases . .		5		5		5		5		3	
Per Cent of Total . .		10.		9.6		9.4		9.4		5.5	

TABLE V (Continued)

	1927- 1928	1929-30		1930-31		1931-32		1932-33		1933-34	
	Dept. Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
Range.....		\$200 to 3600		\$200 to 3600		\$230 to 3600		\$175 to 3600		\$400 to 3600	
Median.....		\$300		\$300		\$360		\$400		\$400	
<i>Real Estate</i> Number of Cases...		2		3		3		2		2	2
Per Cent of Total..		4.0		5.7		5.6		3.8		3.7	3.7
Median.....		\$275		\$400		\$400		\$372 .50		\$162 .50	\$1750
<i>Speaking</i> Number of Cases...	15	2	1		1	2	2	2	1		
Per Cent of Total..	8.5	4.0	3.3		2.8	3.8	5.4	3.8	2.7		
Median.....	\$150	\$200	\$500		\$500	\$150	\$650	\$175	\$300		
<i>Summer Camp</i> Number of Cases...	19		4	2	2		2		2		
Per Cent of Total..	10.7		13.3	3.8	5.7		5.4		5.4		
Median.....	\$367		\$250	\$900	\$700		\$650		\$650		
<i>Outside Teaching</i> Number of Cases...		3	2	2	3	2	2	2	3	2	
Per Cent of Total..		6.1	6.6	3.8	8.5	3.8	5.4	3.8	8.1	3.7	
Median.....		\$200	\$325	1375	\$275	1500	\$225	1125	\$182	1125	
<i>Business Commission</i> Number of Cases...		1	1	1	1	1	1		1		1
Per Cent of Total..		2.	3.3	1.9	2.8	1.9	2.7		2.7		2.7
Median.....		1000	\$300	\$500	\$300	\$500	\$250		\$150		\$150
<i>Professional Entertainer</i> Number of Cases...		1		1		1		1			
Per Cent of Total..		2		1.9		1.9		1.9			
Median.....		\$310		\$450		\$252		\$67			
<i>Playing Professional Sports</i> Number of Cases...	13										
Per Cent of Total..	7.3										
Median.....	\$500										
<i>Private Medical Practice</i> Number of Cases...	4										
Per Cent of Total..	2.3										
Median.....	\$333										
<i>No Supplementary Income</i> Number of Cases...		21	9	21	11	20	9	20	12	21	12
Per Cent of Total..		42.	30.	40.3	31.4	37.7	24.3	37.7	32.4	38.8	32.4

Not Head	
3	
3.7	
\$1750	

3
3.7
\$1750

1
2.7
\$150

13
—
2.4

TABLE VII
DUTIES

Academic Year....	1927-1928	1929-30		1930-31		1931-32		1932-33		1933-34	
	Dept. Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
Administrative Duties											
Number of Cases...		45	22	48	28	49	31	49	31	51	31
Per Cent of Total...		91.8	73.3	92.3	80	92.4	83.7	92.4	83.7	94.4	83.7
Median.....		4-60	3-35	4-60	3-35	4-60	1-35	4-60	2-35	4-60	2-35
Av. months per yr...		17	10½	17	11½	17	11	18	11	17½	11
		9 2/3	9	9½	9	9 1/3	9	9½	9	9¼	9
Teaching Physical Education Theory											
Number of Cases...	80	29	17	31	21	31	20	33	21	35	21
Per Cent of Total...	45.2	59.1	56.6	59.6	60	58.4	54	62.2	56.7	64.8	59.4
Range											
(Hrs. per week)....	1-24	2-10	2-12	2-10	2-12	2-10	2-26	2-10	2-20	2-10	2-19
Median.....		6	7	6	6	6	8	6	8	6	7
Av. months per yr...		8½	9	8½	9	8½	9	8½	9	8¾	9
Teaching Other Physical Education Activities											
Number of Cases...	51	22	21	23	21	23	25	21	22	20	21
Per Cent of Total...	29.0	44.8	70.	44.2	60.	43.3	67.5	39.6	59.4	37.	59.4
Range											
(Hrs. per week)....	2-21	2-5	2-25	3-15	2-25	3-17	2-25	2-19	2-25	3-20	2-15
Median.....		6	8	6	11	6	10	6	11	6	11
Av. months per yr...		9	9	9	9	9	9	9	9	9	9
Teaching Hygiene											
Number of Cases...	41	17	8	16	8	15	10	16	11	18	10
Per Cent of Total...	23.2	34.6	26.6	30.3	22.8	28.3	27.	30.1	29.9	33.3	27.
Range											
(Hrs. per week)....	1-10	½-10	1-7	½-10	1-6	½-10	1-9	½-10	2-9	½-10	1-6
Median.....		2	3	2	5	3	4	3	4	3½	4
Av. months per yr...		7½	7	7½	8	8 2/3	8 2/3	8	8	8	8
Intramural Supervision											
Number of Cases...	7	16	11	17	13	17	17	15	17	16	17
Per Cent of Total...	4.0	32.6	36.6	32.6	37.1	32.	45.9	28.3	45.9	29.6	45.9
Range											
(Hrs. per week)....	3-12	1-8	1-30	1-8	1-30	1-8	1-30	1-15	1-30	1-15	1-30
Median.....		2	6	3	6	3	5	3	7	4	7
Av. months per yr...		8	9	8	9	8	9	8½	9	8½	9
Civic Club Work											
Number of Cases...		14	4	15	5	15	5	13	5	13	5
Per Cent of Total...		28.5	13.3	28.8	13.2	28.3	13.5	24.5	13.5	24.	13.5
Range											
(Hrs. per week)....		1-4		1-4		1-4		1-4		1-3	
Median.....		2	2	2	2	2	2	2	2	2	2
Av. months per yr...		9½	9	9½	9	9½	9	9½	9	9½	9
Teaching Other Academic Courses											
Number of Cases...	14	9	1	9	2	9	2	7	2	7	2
Per Cent of Total...	8.0	18.3	3.3	17.3	5.7	16.9	5.4	13.2	5.4	12.9	5.4
Range											
(Hrs. per week)....	2-15	2-25		2-25		1-6		2-25		2-34	
Median.....		3	6	3	7½	3	5	3	5	3	6
Av. months per yr...		6	9	7	9	7½	9	8½	9	8½	9
Coaching Football											
Number of Cases...		8	5	9	6	9	6	9	8	10	7
Per Cent of Total...		16.3	16.6	17.3	17.1	16.9	16.2	16.9	21.6	18.5	18.9
Range											
(Hrs. per week)....		2-24	12-24	2-24	12-20	2-24	12-24	2-24	12-24	2-24	12-48
Median.....		16	14	18	17	18	15	14	15	13	17
Av. months per yr...		3	3	3	3	3		3		3	

TABLE VII (Continued)

Academic Year...	1927-1928	1929-30		1930-31		1931-32		1932-33		1933-34	
	Dept. Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
<i>Coaching Basketball</i>											
Number of Cases...		7	3	6	4	6	5	6	8	6	7
Per Cent of Total...		14.2	10.0	11.5	11.4	11.3	13.5	11.3	21.6	11.1	18.9
Range											
(Hrs. per week)...		8-20		8-20		8-20		8-20		8-20	
Median.....		10	12	11	12	11	13	11	13	11	14
Av. months per yr...		4	4	4	4	4	4	4	4	4	4
<i>Committee Work</i>											
Number of Cases...	6	7	1	8	1	8	1	9	1	9	1
Per Cent of Total...	3.3	13.2	3.3	15.3	2.8	15.0	2.7	16.9	2.7	16.6	2.7
Range											
(Hrs. per week)...		2-5		1-5		1-5		2-5		2-5	
Median.....		3	2	3	3	3	3	3	4	3	5
Av. months per yr...		9½	9	9½	9	9½	9	9½	9	9½	9
<i>Coaching Baseball</i>											
Number of Cases...		5	5	7	4	8	3	7	7	3	7
Per Cent of Total...		10.0	16.6	9.6	20.0	7.5	21.6	5.6	18.9	5.5	18.9
Range											
(Hrs. per week)...		6-16	9-18	3-16	9-18	6-16	6-18	6-16	6-18	6-16	6-18
Median.....		12	13	12	15	12	14	12	12	12	13
Av. months per yr...		2½	3	2½	3	2½	3	2 2/3	3	2 2/3	3
<i>Coaching Track and Field</i>											
Number of Cases...		4	5	5	5	5	5	5	6	5	6
Per Cent of Total...		8.1	16.6	9.6	14.2	9.4	13.9	9.4	16.2	9.2	16.2
Range											
(Hrs. per week)...		10-15	3-21	10-18	3-21	10-18	3-21	10-18	3-21	10-18	3-21
Median.....		13.5	9	15	9	15	9	15	11	15	11
Av. months per yr...		4	6	4	6	4	6	4	6	4	6
<i>Boy Scout Work</i>											
Number of Cases...		4		4	1	5	1	5	1	4	1
Per Cent of Total...		8.1		7.6	2.8	9.4	2.7	9.4	2.7	7.4	2.7
Range											
(Hrs. per week)...		1-4		1-4		1-4		1-4		1-2	
Median.....		1½		1½	1	2	1	2	1	1½	1
Av. months per yr...		10½		10½	10	10	10	10	10	10½	10
<i>Church Work</i>											
Number of Cases...		3	1	3	1	3	1	3	2	3	2
Per Cent of Total...		6.1	3.3	5.7	2.8	5.6	2.7	5.6	5.4	5.5	5.4
Range											
(Hrs. per Week)...		1-6		1-6		1-6		1-6		1-6	
Median.....		2	1	2	1	2	1	2	2	2	2
Av. months per yr...		9	10	9	10	9	10	9	10	9	10
<i>Research</i>											
Number of Cases...					1		2		2		3
Per Cent of Total...					2.8		5.4		5.4		8.1
Median.....					24		17		17		10
Av. months per yr...					9		9		9		9

Other duties reported by one person for each of the five years (1929-1933) and requiring from one to five hours per week of time for nine months of the year:

Health Survey
 Alumni Secretary
 Recreation Council
 Community Chest Work
 Departmental Conferences

Hospital Board
 College Book Store
 Y.M.C.A. Board
 Outing Club
 Educational Organizations

Lodge Work
 American Legion
 Assistant Dean
 Soccer Coach
 Gymnastics Coach

A study of the size of the full-time male physical education staff for which the director is responsible (Table VIII) shows that in 1927-1928 it consisted of a median of 5.8 men. The depression years did not decrease this number in the 67 schools involved, a fact which seems remarkable in view of the supposedly widespread unemployment of college teachers. In 1927-1928, 30.3 per cent of the directors were responsible for the physical education of women in their respective institutions. Over the past 5 years there has been a slight decrease (30.6 per cent to 27.7 per cent) in this percentage.

TABLE VIII
SIZE OF STAFF

Academic Year	1927-1928	1929-30		1930-31		1931-32		1932-33		1933-34	
	Male (Full Time)	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head	Dept. Head	Not Head
<i>Size of Staff</i>											
Number of Cases...	177	46		48		48		48		50	
Range (Size of Staff)		1-52		1-54		1-54		1-54		1-54	
Median.....	5.8	6		5.5		6		6		5.5	
<i>Responsible for Department of Physical Education for Women</i>											
	54	15		16		16		15		15	
Per Cent of Total..	30.3	30.6		30.7		30.1		28.3		27.7	
<i>Size of Women's Staff</i>											
Range (Size of Staff)		1-14		1-18		1-14		1-15		1-14	
Median.....		3		3.5		4		5		4	

CONCLUSIONS

This study indicates that physical education in the sixty-seven colleges and universities involved has held its own remarkably well during the financial depression of 1929 to 1933. There has been a substantial increase in the median salaries over the year 1927-1928. Supplementary incomes, while decreased in most cases, still contributed significantly to the annual salary of the physical educator during the depression.

While one might suppose that physical education suffered materially during the past five years in all respects, the data indicate that in these sixty-seven schools such was not the case. There has been a satisfying increase in faculty rank; the duties of the physical educator have not been increased to any abnormal extent either as to the number performing a function or the number of hours per week required to execute it and the size of the full-time male staff has remained about the same over a seven-year period.

The Curriculum in Health Education for Teachers of Elementary Grades

By PHILOMENA SUPPER
New York City

THIS development of a practical curriculum in health education for teachers, shall be limited to the elementary classroom teacher. No attempt will be made to consider the high school teacher, the special health teacher, nor the health supervisor. The major factors considered in this curriculum development comprise the following:

1. The need of health education in the curriculum for teacher education, indicating trends of both society and school.
2. The inadequacy of the health field in meeting the needs of society and education as a result of a lack of progressive curriculum revision common to college teaching; also as a lack of perspective of health educators as to the educational needs and often health needs.
3. Professionalizing courses in teacher education: definition and understanding of the term; value of professionalized courses, and the need for professionalized courses in health education.
4. A practical curriculum in health education for teacher education of elementary schools: professionalizing the content course in health education; developing a course in methods and materials that will serve as a foundation for independent growth and expansion in the future field.
5. The importance of observation and practice in the health education curriculum for teachers; also testing of this instruction and practice in the field.
6. Conclusions: Concession to health education of its rightful place in the curriculum through definite goals of health education in keeping with the best principles of education, and through teacher education rather than teacher training.

I. THE NEED OF HEALTH EDUCATION IN THE TEACHER-EDUCATION CURRICULUM

There has been a tremendous interest in health by society and education probably for two reasons: the development of science on the one hand and the growing complexity of life on the other.*³ The scientific contributions have brought about changes which in turn have created social and

* Numbers refer to bibliography at end of article.

health problems. Science in addition is constantly revealing new and better ways of living, thus increasing both opportunities and responsibilities on the part of educators. While education has succeeded in interesting persons in seeking health, it has not yet succeeded in giving balanced judgment to health matters. This is evident in the particular susceptibility in unscientific beliefs among the more educated, due, perhaps, to the commercialization of health.¹⁵ A lack of health knowledge is actually a handicap to man in modern society; for science is constantly developing and demanding new adaptations in health behavior. We cannot hope for marked progress in the further development of community and national life without dealing with the problem of individual health.³ Individuals must be furnished with tools of constructive thinking so that habits of acting in the light of possible consequences to one's self and others will result. Since health is based on the several sciences, a scientific background is the only way to help persons to think intelligently in regard to modern health problems. We need a rational adjustment to our biologic needs for experience indicates everywhere that these needs cannot be ignored—therefore, it is necessary that man adjust the environment accordingly.²² The oncoming generations then should be trained to deal more intelligently with their problems than have persons in the immediate past.⁴ No single attribute, whether it is possessed by the individual or the social group, is more essential to material or intellectual success than good health.¹⁶

The progress of science, with the resultant social change, has made the school function more complex and the achievement of its goals more important. Intelligent guidance and direction on the part of the teachers, rather than chance learning, become paramount in order to give the training and education essential to meet adequately the modern health problem of individual and community. No other person outside of the child's own home has such control and such opportunity for establishing in children's minds the positive habits of health. The teacher is the one person who is in contact with the child day by day and year after year.¹ Many teachers, nevertheless, have little or no interest in the subject of health education. It is a matter of common observation, however, that one likes to teach what one knows best. This may account for the average teacher's lack of enthusiasm.¹⁶ Since the teacher is placed in the important position of determining to a large extent the health needs of children, it is evident that the results obtained in any school program will largely be determined by teacher education in health education. The influence of the teacher is naturally limited by her professional preparation. In fact, Dr. Charles Emerson claims that the greatest enemies of health education are not those who fight it but the enthusiastic reformers without training who practice it. The teacher must know the science before she can apply it. A foundation of basic sciences gives her hygienic knowledge a rational

basis and is essential for all teachers in the primary or secondary fields. It makes for sound scholarship without which the modern health teacher and the modern health program cannot hope for the respect of the general educator.

It is generally conceded that it is the classroom teacher and not the health specialist who should carry on the burden of responsibility for health activities of the schoolroom. In this connection Miss Mealey in her article, "Health Education for Teachers—Some Trends in Their Preparation," states, "There appears to be a growing tendency to recognize the educational function of all health service and to use school activities and situations as opportunities for instruction and practice."⁸ The classroom teacher of the elementary school is emerging from the rôle of health instruction to a position where she is actually concerned with and participating in all phases of the school health program. An increasing number of teachers are beginning to realize that the solution of all their problems has health as an important factor. Miss Mary Spencer in her dissertation, "Health Education for Teachers," states, "Since the development of the modern health education movement, 1918, the rôle of the teacher in school health work has become increasingly greater. The newer interpretation of health in its social and mental as well as physical aspects together with the concomitant attention to racial health, mental hygiene, and the hygiene of instruction in schools have brought about demands for attention to the whole child. This is making and has made new demands upon the teacher's knowledge and appreciation of health subject matter as well as upon the ability to make this knowledge functional in the classroom situations."¹⁰ The teacher's curriculum in health education, then, is of paramount importance.

II. THE INADEQUACY OF THE HEALTH FIELD IN MEETING THE NEEDS OF SOCIETY AND EDUCATION

To insure the validity of any curriculum there must be, from time to time, a revision of curriculum principles to meet the growing or changing needs of society and education. Mr. Gray in his article, "The Academic and Professional Preparation of Teachers," states, "One of the impressive lessons which a century of effort has taught, is that the instruction for prospective teachers must be continually revised in the light of changing social needs and the results of experimentation."⁴ This is a particularly timely admonition for educators concerned with health education curricula in teacher education; for, indubitably, there has been an inadequate perspective not only of the educational vision which is so essential in a progressive curriculum, but also there has been a definite lack of vision of the increasing needs and opportunities of the health field. Because of the development of science and the social changes concomitant with the progress of science there has come considerable educational change. Furthermore, the scientific attack on the growth and development of the child,

which is comparatively recent, has resulted in a new directing ideal in education. Science has proved experimentally that growth with certain limitations is adaptive and responsive to internal and external influences and that the whole cycle of child growth can be increasingly modified by many factors under our control.²⁴ The increased understanding of child growth and development has modified our educational concepts and is leading to newer and better curricula. Therefore, in addition to the responsibility of keeping abreast of the materials of scholarship extant in the health field, the teacher of teachers must be cognizant of the professional obligations in regard to the emphasis of current educational theory as tantamount to that of the special field. In other words the concern must not only be with scholarship in the special field, but with current thought with regard to school use in that field. Furthermore, a proper perspective of the entire educational field should be envisaged—the demands of school and of society outside of school.¹³

Many of the college courses in health education, however, have been of a superficial nature and indicate a lack of thoroughness. Frequently courses in health education comprise largely ready-made methods and devices, which offer no solid bottom, instead of fundamental subject matter and essential principles of education and how to apply them.²⁵ Dr. Williams in his article, "The Teaching of Hygiene in Colleges," states, "One of the reasons why college hygiene is in disrepute is that there has been too little appreciation of the problems involved both in content and preparation of teachers. Frequently college courses deal with elementary facts. College hygiene should be attacked from a different point of view than the conventional subject. It should have for its mastery not subject matter, but mastery over one's self. This involves not only choice of subject matter but a presentation that will stimulate students in a thoroughgoing practice in what they learn." Often in the smaller schools there is a dearth of courses, many offering merely a single course of one, two, or three points; while in the larger schools the courses are often numerous, but are spread conspicuously thin.⁷ It was interesting to know in this connection that Miss Ready in Bulletin 10, Office of Education, quoted from a letter of Dr. J. E. Raycroft, Princeton University, "That the *one* course in hygiene for all students was discontinued since 1926, because the results appeared incommensurate with the instructional burden involved."¹⁴ This bulletin also states that, "Other institutions have abandoned the one-hour lecture course in hygiene as unsatisfactory."¹⁴ Furthermore, in the larger schools unless the courses are reduced in number and given some depth they will not serve to bring about that critical and flexible attitude toward professional practices so necessary in order to be in keeping with our educational philosophy today.

The fundamental consideration in health education should be on the all-important task of reorganization of subject matter. If courses in health

education were more clearly defined a great saving of time and more effective teaching would accrue. We need to consider the material to which we apply the method. We need a thorough study of content in the light of both immediate and future health problems; and in the light of both past and present health practices, as well as future trends. When it is realized that in the medical profession alone more progress has been made in the last fifty years than during the whole period of civilization, the task of reorganization for growth looms large. This reorganization should be on a qualitative basis rather than quantitative. Endeavor should be made to have expansion result in enrichment and not duplication. Just as general education must continually revise its curriculum to meet the newer problems as scientific and social changes occur, so too, the field of health education must make the necessary effort to adjust its curricula. Dr. DeKleine in his article, "The Need for Uniformity in Health Instruction," claims that the greatest advance in public health has come through organized effort in sanitation and control of environmental factors responsible for the spread of communicable disease, and infers the need of the profession of education to assume the responsibility of an organized effort in the production of a well-defined course of instruction and a plan of procedure that admits of universal application.²

III. PROFESSIONALIZING COURSES IN TEACHER EDUCATION

Since an important factor in teacher education is the power to adjust and adapt training to teaching situations,¹⁹ it would seem that the need for the reorganization of general subject matter of collegiate level should be in terms of professionalized content. In professionalizing content, a clear understanding of the term is needed in order to make better application of it. It is the usefulness of the subject matter that distinguishes professionalized subject matter from the academic. It consists of a revaluation of subject matter from the point of view of its future use in teaching. It involves a conscious organization of instruction of subject matter in reference to professional responsibilities of the future teachers, the transmission of fruitful methods of study, and purposeful affecting of attitudes and techniques.¹⁸ Professionalized subject matter is not necessarily simpler in content—it must be developed beyond the point of usefulness.⁵ It should include not only content which may be used only occasionally with pupils, but also such content which will enlarge and enrich the teacher's understanding and interpretation of the subject in its several relations. It should develop such perspective as to make the teacher sensitive to its many significant uses. This implies the teacher's possession of knowledge far beyond that which can be taught to pupils. In the Special Number 1933, of the *University of Kansas Bulletin*, Mr. W. R. Smith in his article, "The Value of Professional Training in Education," gives the following three purposes as generally recognized of all pro-

fessional training: (1) to impart professional knowledge and improve technical skills; (2) to advance knowledge in the field of critical examination of values by experimentation of other research; (3) to promote professional standards, to promote professional relationship, and to develop professional leadership in the fields of service represented.¹⁸

Professionalized subject matter is not a plea for methods courses rather than subject matter but to the contrary. The Committee on Required Courses in Education of the American Association of University Professors shows in its report a widespread opposition to undue emphasis placed on technical training as compared with subject matter to be taught. In fact, the Committee recommends that due emphasis be given to further study of subject matter and, furthermore, that professional courses be limited to twelve semester hours. Professor Sullivan in his article, "Methods versus Subject Matter in Teaching," states, "In the effort to find a better way we have tended to lose sight of the importance of a thorough knowledge of subject matter to be taught. Putting greater emphasis on method is like putting the cart before the horse. We need to reach a proper balance between subject matter and method. Before a student can think intelligently and scientifically in any field he must have a thorough knowledge of the field. Nothing in teacher preparation will ever take the place of broad, deep grounding in knowledge of the subject matter to be taught."²¹ It has also been said that no one sees further into a generalization than his own knowledge extends. As we grow in comprehension we see more definitely the meaning of familiar details. Dewey claims the chief weakness in our grammar schools today comes not so much from lack of knowledge of special methods, as from lack of scholarship and the spirit of inspiration that goes with it. Hurd's article on "What is Professionalized Subject Matter in Teacher Training" offers interesting applications in science which are tantamount to the field of health education.⁵ It is quite comprehensive and yet concise. Mr. Gray states that "Contemporary needs suggest that teachers be provided with both depth and breadth of education. There is an increasing demand for two important techniques in teacher education. The extension of knowledge of subject matter to be studied for each subject has its own body of ideas, its own logic of organization, its own springs of human interest, its own process of growth and expansion; the second technique enables the teacher to discover, organize, and interpret facts in various fields that contribute to an understanding of the broad problem. These techniques are important in renewing and expanding the curriculum. Experience has shown that only as teachers are able to deal intelligently and constructively with curriculum problems does teaching rise to higher levels."⁴

The following sententious interpretation of professionalized subject matter by Randolph might well be given: (1) On the side of scholarship,

such new views of generally familiar material as will reveal its racial significance and its potentialities for public education; and such extensiveness of scholarship as will be most likely to insure flexible content of the problems of utilizing the study in a particular situation. (2) On the side of method, it implies a conscious organization of instruction in subject matter with reference to professional responsibilities of the future teachers; it involves transmitting a principle of method and the purposeful affecting of attitudes and techniques.¹³

IV. A PRACTICAL CURRICULUM IN HEALTH EDUCATION

In health education with its rapidly growing body of knowledge, intelligent selection and adaptation of subject matter is particularly essential in the preparation of teachers. There is a great need to organize all significant knowledge principles and to show how they are significant to the health of children and also how they may be applied. A reorganization of courses with a better selection of content would allow for the enrichment of health education courses without a further time allotment than at present required. Not only a better selection of professionally useful material but a better organization of the material into fewer courses would give the classroom teacher a richer and more adequate preparation than the traditional set-up in many teacher education institutions. Furthermore, professionalizing subject matter is developing for the college instructor. The necessity for making abstract learnings meaningful to a class serves to improve the teacher's own method by a constant attention to the methodology used. Originality is necessarily fostered in such courses. Thus it may be seen that the development of a curriculum in health education involves many issues. An attempt will be made in the development of the following practical curriculum to apply some of the principles previously evolved.

A curriculum for teachers in the elementary grades should be developed on a sufficiently broad basis to enable the prospective teacher to carry on independently a well-rounded school health program. Sufficient time allotment should be given to this training and education to insure the outcomes comparable with other long established courses in the elementary curriculum. This it is believed should require a minimum of eight semester hours; four for a professionalized subject-matter course; and four for a course in methods and materials. The two primary considerations in any teacher's program are: the kind of product it is desired to produce; and the needs of the learner in the kind of product desired. Just as the emphasis of the classroom teacher in elementary schools is placed on finding the needs of the group to be taught, so the instructor of teacher education should give her foremost consideration to finding the needs of her group in the light of the applications teachers are expected to make in the specific field. The curriculum should be considered from a fourfold basis: (1) the subject matter needs, its content and scope in

the light of present-day interpretations; (2) the needs in the light of a sound philosophy of education and the major objectives of the elementary school; (3) observation and training in the practice field; (4) a testing of theory and practice in the future field.

The Foundation Course, which should be a professionalized subject-matter course, is undoubtedly the most important in the health curricula. If the ultimate goal in health is intelligent self-direction in the maintenance of sound health behavior, and to meet new problems successfully in adult as well as child life and in both personal and public health, then teacher education must provide a wealth of sound knowledge principles with which to judge, with which to contrast, and with which to predict consequences. Not only should the teacher have sufficient knowledge principles to enable her to realize that hygienic practices are based on scientific principles, but she should have adequate knowledge principles to aid in the solution of the individual, school, home, community, national, and racial health problems. In health education there must be a large amount of specific knowledge for a sound basis upon which to reason and upon which to make intelligent adjustment; for the specific health situations which must be met require specific learnings. For instance, there must be a specific habit to prevent a particular danger; there are specific practices to promote physical efficiency; there are specific preventions for specific diseases. The teacher must know the scientific "why" behind all of these and more. A scientific background is the only means to intelligent thought and action in regard to modern health problems. Thus it may be seen that the knowledge principle for teacher education should not be minimized, but so presented as to result in the realization of the need for application. Once cognizance of the need is secured little further effort will be required to insure application. Furthermore, with emphasis of teaching on the child rather than the subject, it is necessary to have ten times more of a subject-matter background than in the traditional type of teaching.

In this professionalized subject-matter course emphasis should be given to subject matter and standard practices essential for teachers to carry on an effective school health program. The three major fields to be considered are personal hygiene, child and school hygiene, and home and community hygiene. In addition some consideration should be given to mental hygiene, social hygiene, safety first, and first aid. Throughout the course knowledge principles and standard practices in relationship to these should be applied to the school health program. Frequent emphasis should be made in regard to the improvement of the following: the teacher's own health; the health status of pupils; the classroom and school environment; health habits, attitudes, and knowledges.

While the college hygiene course is no longer advocated in curricula for teachers in health education, considerable attention in the beginning

of the professionalized course should be given to the student's health needs. With increased professional demand has come a new emphasis on the teacher's personal health requirement. Since one of America's greatest shortcomings is a lack of application of the knowledge we have at our command, health practices should be stressed. The keeping of a health activity record by the students is seemingly one of the best means to bring this about.¹⁰ The activity requires the student to analyze her own health status in order to determine personal needs and to devise ways and means of increasing physical and mental efficiency on the basis of these needs. This activity record stimulates not only a greater striving for positive health habits, but is likely to aid the student to become an exemplar of health in the classroom, which is important because the teacher is the most outstanding influence in the environment. Moreover, the actual experience of acquiring new habits, which invariably demands the unlearning of old habits, establishes a valuable mind-set in regard to the importance of early training together with the principles applied in habit formation among children. The testing of the effect of these new habits on efficiency, the checking of successes and failures in acquiring the health habits, selected on the basis of needs as determined by an analysis of their own health status, together with the realization of the amount of patience and perseverance required to be successful, is invaluable to the student's future teaching.

Another important factor in the student's health is the campus environment. Besides being a silent force in education it should be a reservoir of opportunities for teaching health activities. Such environmental conditions should be set up as will serve to promote the substitution of favorable for unfavorable habits. While teaching through the campus environment may be unconscious, it is often more effective than classroom teaching. The campus then should apply the best practices of scientific principles and should set the pace for desirable ventilation, lavatory facilities, sanitary cleaning methods, communicable disease control, safety-first devices, et cetera. The environmental conditions besides furnishing valuable teaching material have a direct effect upon the health and consequently upon the efficiency of the student body. The preparation of teachers in health education is not adequate unless it is carried over into the environment, therefore the environment should be a close concern of administrators.

The health service is another important factor which serves to promote personal health and hence professional efficiency. The health service should not only detect gross defects but any factor that might lessen the fullest efficiency which the student's biological endowment permits or which might interfere with full maintenance of vigor under the strain of teaching. Students should be urged to have remediable defects corrected before entrance and should be automatically dropped if correction of remediable defects is not procured within a reasonable time. Since there is

an increased recognition of health in the efficiency of the teacher, a health certificate should be a requisite for graduation. The college infirmary while serving as an emergency measure should also be an educational opportunity for those who for some reason have failed in maintaining health. Much direct and indirect health teaching is possible through the activity record, through the environment and through the health services.

While due consideration should be given to the care and protection of the students themselves, the major emphasis should be on teaching health education in the elementary schools, or the improvement of the health status of the pupils. If the emphasis today in health education is to be on the promotion of normal growth and development of children rather than on detection and correction of defects and disease,²⁵ it is essential for teachers to get a biological perspective of the child. It is not only necessary for teachers to know the order of development of the major organs of the body, but the critical periods of each organ, the effects of these on the various functions throughout the growth period, and the specific hygiene required. It is also necessary for teachers to know something of the morbidity and mortality statistics of children; to know the degree of resistance at the various ages and the prevalence of diseases; also the defects commonly found among children together with the methods of prevention, detection, correction, and treatment. In addition teachers should know the relation of physical to mental development as well as menti-motor development.²³ Since nutrition is the chief external influence of growth, and since the departure from optimal instruction tends to express itself in more or less destructive behavior signs, a unit in nutrition is another basic consideration. This should include the fundamentals of nutrition—food classification, the body's utilization of food, efficient selection, protection against fads, deficiency diseases and maintenance of optimal energy.¹¹ It should in addition consider malnutrition—causes, signs, effects, method of prevention, and correction, also school application in a prosecutorial and preventive program.

The inspection, not only for the control of the communicable diseases but also for the detection of defects, is gradually but increasingly delegated to the teacher; therefore both instruction and practice work should be provided in teacher preparation. In many places the physician examines only such children as are referred by the teacher for apparent deviations from the normal. Health experts have come to regard these inspectional activities by teachers as one of the most valuable contributions to the school health program. The White House Conference in Child Health and Protection called attention to the fact, that neither disease nor defect await the annual advent of the physician or even the weekly or monthly visit of the nurse, and recommended especially that the training of all teachers for the detection of signs of communicable disease and gross physical defects be required by law.²⁴ Miss Ready's report, Bulletin No.

10, showed that many teacher-education institutions gave instruction and practice in this work.¹⁴ The correction of defects, however, is a real test of the effectiveness of the service program; therefore, the prospective teacher should be given guidance in the cooperation of the school with the home and other social institutions. Teachers need to know how to approach mothers and how to carry on an effective parent-teacher program. School health programs cannot be effective without the cooperation of parents; for the results of health habit teaching are directly in proportion to home cooperation. Miss Mealy in her article in regard to "Trends in Teacher Preparation" states, "There is an evident appreciation of the responsibility of the home and a desire to cooperate with the home on the part of the teacher."¹⁵

The improvement of the classroom and school environment is another emphasis on professional application of subject matter that should be considered. Control of the environment is a fundamental factor in the promotion of normal growth and development of children. The school must provide an environment that will reduce the need for correctional service and that will prevent undue nervous expenditures, and that will control preventable disease. Furthermore, a salutary environment not only has a direct effect on the health of the pupils but furnishes valuable teaching material. The environment is considered the chief single teaching force in the teaching of health and should be arranged according to the best principles of health education. Moreover, experiments have proved that the chief difficulty in getting children to practice desirable health behavior is largely due to a lack or difficulty in the environment. The knowledge principles of school hygiene, hygiene of instruction, and the fundamental factors in the control of preventable disease together with pertinent applications should be adequately considered.

The inference that mental hygiene is a minor consideration in the professionalized content courses does not mean that it is unimportant. There are many opportunities for the instruction and application of the principles of mental hygiene throughout the course. If the course is planned with this in view this phase of health will not be overlooked. An endeavor should be made, however, to culminate these principles by way of a review or summary in a few periods toward the end of the course. Such stimulation in this aspect of health work should be given so as to result in the desire to take further work in mental hygiene as an elective.

Essential principles for teachers together with demonstration and practice should be given in first aid and safety first with further incentives to take elective work; for the needs of the nation are such as to make an increasing demand for these among both teachers and the public.

Special methods courses should not be subject-matter review courses but should apply general method to the specific subject field and give

attention to curriculum problems. In the course on methods and materials the emphasis should be on principles rather than devices of method. In the preparatory training of teachers there has been too much stress on the tricks of the game rather than on the child's powers of thinking and cultivation of the art of social living.⁹ Teachers need to be aided in gripping fundamental principles of method rather than in creating interest and in giving training in the use of devices. Methods are constantly changing and emphasis on any method in vogue at the time may lessen the future flexibility of the teacher and actually stunt teacher growth and development. To assure freedom in teaching the teacher must be cognizant of and know how to apply the fundamental principles of education. To quote Miss Stratemeyer, "Principles orient us in purposing and in carrying through our purpose. Principles when based on fact and experience serve as controls which contribute strength and solidity as new situations arise. Cultivation of the application of these principles enables the teacher to be creative, original, resourceful instead of indulging in a bag of handy tricks or devices. . . Principles are abstract generalizations and invariably are meaningless to the student, unless constant application is made to many different situations."²⁰ As soon as the technique in the use of principles is acquired and there is assurance with principles, teachers not only enjoy the freedom, but are in better position to give children similar freedom. A clear understanding of fundamental principles of education provides a basis for continuous potential growth for both teacher and children. The development of a common body of principles of education in a methods and materials course is especially important in health education as the field has been ushered into the elementary curriculum with such enthusiasm that it has sinned much against the best principles of education.

Considerable emphasis, and, whenever feasible, practice should be given to find health needs or problems in child life and school situations. This serves as a basis of analysis for the determination of health objectives. It also fosters in the teacher a creative viewpoint in her work of health instruction as well as aids her in utilizing the potentialities of the specific situation in which she finds herself. The factors that should be considered in the formulation of the objectives are the health needs of the individual, the school, the home, the community, the nation, and race. Skills in finding the needs will also serve as a basis of measurement of achievement.

To make the list of objectives function in the thinking process of the teacher requires such detailed thinking of each, as to result in the development of specific educational situations. Therefore, principles and methods in the selection of experiences, content, and material should be applied to the objectives determined upon. Integration throughout the grades in the elementary school should also be included.

Another major emphasis in the methods and materials course should be placed on principles, method of technique, and evaluation in units of

teaching. Practice in making long units of teaching for a specific grade for one semester should be included. The unit of teaching should be a preplan or the student's best guess in procedures. If the preplan is tried out and incidentally adjusted to meet the immediate needs of a specific group, and, if in addition it is rated or improved as it is being tried out, it will serve as a practical basis for a course-of-study construction. Moreover, this is believed to be one of the best methods of course-of-study development.

With the wealth of material available in the health field, selection and organization of material plays an important rôle. Students should also evaluate recent health texts on the basis of definite criteria designed to train in discrimination as to presentation, pedagogic soundness, and scientific accuracy. This not only serves to familiarize students with recent material, but also serves as training and practice in the selection of health texts.⁵

V. THE IMPORTANCE OF OBSERVATION AND PRACTICE

In addition to the theoretical courses an observation and practice course should be offered. This course plays perhaps the most important rôle in the teacher's curriculum in health education, for, in comparison with theory, the practice field leaves a rather vivid impression upon student teachers. It was interesting to note that in the extensive study made by the University of Minnesota on the "Relative Professional Training Value," practice teaching ranked first for direct actual help to beginning teachers.¹² Practice teaching serves as an excellent testing ground for all the theory taught in the foundation course and methods and materials. Provision for observation should be planned and followed by interpretation and constructive discussion of critic teachers, subject-matter specialists, as well as specialists in the fields. The student should have sufficient practice in the training school to qualify her to meet the specific needs of her state. The student needs to see and experience the health program in action in order to get a real understanding of it. Therefore, every training school should have a model health education program showing how to protect and promote the health of its pupils. The health teaching skills should include the measurement of classroom achievement in the light of acceptable standards in health education. Miss Rood in her article on "Training of Teacher in Health Education" states, "Every student should study children under the supervision of the teacher. The study should include all phases of child development. Such study enables the student to individualize the child's needs in terms of physical changes, habits, and attitudes and to make the health program a vital thing to each child."¹⁷ It seems needless to state that success in a health program in the practice school will largely determine the success of a school health program in the field. Yet in Miss Ready's report, Bulletin 10, is stated, "Practice teaching in health

is included to some extent by only a *very small per cent* of teacher-training institutions."¹⁴

The final aspect of the teacher's curriculum is the testing of this theory and practice in the future field in which the student finally proves the value of the instruction received. This involves supervision which offers both guidance and help, especially in the communities where no immediate aid is available. Furthermore, the supervision should aid the teacher to link up her work rather closely with other agencies and thus endeavor to unify the work of all contributors in the interest of children's health. Ideally the supervisor should serve jointly the college and the state department of health and education. Her field reports should give valuable data for the guidance of future work. The college should in turn make a critical analysis, revaluation, and a readaptation of these data; thus cumulating rich source material for the development of greater possibilities in health education.¹⁷

VI. CONCESSION TO HEALTH EDUCATION OF ITS RIGHTFUL PLACE IN CURRICULUM

In conclusion, it may be stated that the health education in the schools is indubitably of the most vital importance to the child, school, and nation. In order that health be conceded its rightful place in the curriculum by general educators, health educators must determine upon definite objectives that will meet the changing needs of school and society, and frequently adapt methods and procedures that will serve to achieve these objectives in a manner that will be in keeping with the principles of education. As Miss Whitney so well states in "Health Education, Whither Bound?" "We need first of all to determine valid goals in health education and then to ascertain by frequent appraisal whether the methods and procedures are in harmony with the goals."²⁰ Unless one has definitely in mind the results one is after and seeks them directly and specifically one is apt to miss the goals. It has been said that the world steps aside for the man who knows where he is going. So too, educators will step aside for this new field, if its leaders can indicate definite and comprehensive goals.

The curriculum for teachers must develop the essential fundamental subject matter, but scholarship alone does not qualify for the classroom. The professional knowledge of subject matter is a valid and necessary addition to scholarship in order that teachers shall meet effectively the broader responsibilities which contemporary life imposes upon them.⁴ The teachers' preparation should be on a sufficiently broad basis to enable them to participate intelligently in the continuous expansion, enrichment, and revision of curricula in their future fields.³ If teachers are to give more attention to the interests and purposes of children than they have in the past, they shall need training in research methods for finding the needs and interests of pupils, for guidance of pupils in the light of desirable achievement, and for ways and means of measuring outcomes.⁹

We need teachers in health education whose scholarship is sound, who are critical of their professional practices, who have the gift of suspended judgment, and whose professional education is rich and vital in contacts with children. In other words the teacher's preparation in health education should be considered from the standpoint of professional education rather than training. Training is concerned more with the achievement of patterns of response rather than with the process of development, while education is concerned with the process of inner growth, with the method of acquisition, and with an attitude toward experience.⁵ Professional education which shall develop the attitudes and understandings required for making successive adaptations in curriculum and teaching procedure, which shall be needed to meet the changing social demands and to bring about a progressive improvement of the social order. Such education which shall develop not only a comprehensive insight with the changing relationship of school and society, but which shall also prepare teachers to direct the various phases of school training toward social improvement.¹⁴

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A Survey of the Extent of High School Wrestling in the United States

By B. E. WIGGINS

*Member, National Rules Committee; Director of Physical Education,
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THE following survey of the extent of high school wrestling in this country is probably the first of its kind. Although inquiries were sent to the secretaries of each state association, it is probable that the desired information was not completely available at this time. However, it is believed that the information and suggestions received will be helpful, insofar as a more comprehensive knowledge of the scope of high school wrestling is concerned at least.

It is evident from this digest that high school wrestling has progressed more rapidly in an organized form in the states of Iowa, Oklahoma, New York, Wisconsin, Kansas, Utah, Michigan, Indiana, and Nebraska, than in other sections of the country.

It would appear, from observation and comments received, that the following factors have militated against the inauguration and development of the sport in high schools: (a) the stigma, or unwholesome influence, in many instances, of professional promoters and wrestlers; (b) lack of technical knowledge on the part of school instructors; (c) a community sentiment that sports of an individual-combat nature should not be encouraged; (d) school programs not diversified beyond the point of the so-called major sports; (e) inadequate equipment and facilities to conduct this activity; (f) a lurking fear in the minds of school authorities and parents that more injuries result from an activity of this character than in group (or mass) competition; (g) the feeling, in some sections, that competition should be limited to intramurals.

Apropos the number of schools—closely approximating six hundred—which sponsor or encourage wrestling, the writer feels that the extent and the apparent growth of the sport indicate an appreciation of its value, when the proper supervision and instruction are provided. To those who are genuinely interested in the development of vigor and stamina of the boyhood of the United States, it seems to the writer that this activity might well be more extensively integrated in physical education programs.

Since the data here presented are primarily to show the extent and growth of this age-old sport, commentaries by other writers in the *Guide* should furnish information on other phases of interest to school authorities, and the public at large.

DIGEST OF HIGH SCHOOL WRESTLING QUESTIONNAIRE

Members of National Federation of State High Schools:

States	State Champion- ship	Schools Competing	Schools Sponsoring Wrestling	Instructed by Faculty Members	Rules Used	Intra- murals	Sentiment on Wrestling	Notes
Alabama	No						Very little	Fundamentals in Phys. Ed. classes.
Arizona	No						Adverse— See Notes—	Thus far, controlled by "pros." Hope for H. S. control
Arkansas	No Data					6		
Colorado	No							
Connecticut	No		5 (City)	Yes	National	Yes	Growing interest	
Delaware	No		3	Yes	National	Yes, only	Little value	
Florida	No		10	Yes	National		Favorable	
Georgia	No Data		1				Little interest	
Idaho	No		None					
Illinois	No		16		Modified National	Yes	Interest growing	
Indiana	Yes	10 to 15	10 to 15	Yes	National			
Iowa	Yes	30	40	Yes	National		Very en- thusiastic	
Kansas*	Yes	12	25 to 30	Yes	National		Growing interest	
Louisiana	No		None					
Maryland	No	8 (Balt.)	8	Yes	Based on Collegiate	Yes	Sport popular	
Michigan	No		15 to 20	Yes	National	Yes, many		

*This state was the only one to have a change in the National High School Rules and it put more emphasis on falls by giving more points.

Minnesota	No		A few	Yes	National		Considered beneficial	
Mississippi	No Data							
Missouri	No Data							Championships ruled out 1934
Nebraska	Yes	8	10	Yes	National	Yes	Doubtful	State contact in basketball, only
New Mexico	No Data							Value dependent on calibre of teachers of P. Ed.
New York	No		120	No	National	Yes	Favorable—See Notes	
North Dakota	No		A few	(?)	(?)		Little attention	
Ohio	No		15	Yes	National	Yes	Interest growing slowly	State meet held in 1927
Oklahoma	Probably in 1934	Invitation Meet 19	40 to 50	Yes, only 1 or 2 exceptions	National		1/12 of membership sponsoring	
Oregon	No		12	Yes	National		Not emphasized, thus far	
Pennsylvania	No		75	Yes	National & State	Yes	Interest growing	Plan new code by P.I.A.A.
South Dakota	No		None					Sport not yet discussed by schools
Tennessee	No		None					Tenn. Assoc. does not govern sport
Utah	No		30	Yes	National		Favorable	Interest growing
Virginia	No						Discouraging	
West Virginia	No		Small %—No Data	Yes	National		Favorable	Secty. Assoc. favorable—eqpt. a handicap
Wisconsin	No	None	40 to 60	Yes	National	Yes	Growing interest	

DIGEST OF HIGH SCHOOL WRESTLING QUESTIONNAIRE—Continued

From Directories of Other States:

States	State Champion- ship	Schools Competing	Schools Sponsoring Wrestling	Instructed by Faculty Members	Rules Used	Intra- murals	Sentiment on Wrestling Activity	Notes
California	No		10%	Yes	National	Yes		Assn. averse to interschool comp.
Kentucky	No Data							
Maine	No		None				No interest	
Massachusetts ...	No		12	Faculty and others	National	Yes	Increasing each year	
Montana	No					Some in- clude in P. E. classes		
Nevada	No						Schools not yet consid- ered it	
New Hampshire ...	No		None					
New Jersey	No		Several	Yes	(?) N.C.H.S. Assn.	Yes	Worth while	
North Carolina ..	Yes	8	18	Yes	Modified Collegiate	(?)	Growing interest	Auspices of Brown University
Rhode Island	Yes	10	10	Yes		In a few schools		
South Carolina ...		None	None			Yes		
Texas	No	None	(?)	Yes		Yes	Very little	
Vermont	No					No	Considered valuable	Plan N. W. Wash. league
Washington	No		5	Yes	National	No		
Wyoming	No		12	Yes	National	Some		

A Survey of Health Instruction in Senior High Schools

By D. C. MITCHELL
St. Paul, Minnesota

MANKIND has attempted throughout the history of its development to alleviate suffering and prolong life of individuals. During the past fifty years scientists have made many discoveries which have virtually eliminated epidemics and raised life expectancy about twenty years. However recent studies indicate that there still is considerable sickness and death with their attendant cost, much of which is preventable. The full value of these discoveries is slow in materializing.

Compulsory school attendance has placed all children from five through fifteen years of age easily accessible to a program designed to teach how to live so as to prevent this great waste. The promotion of good health is the first named of the Seven Cardinal Aims of Education. The senior high school grades apparently are the first grades where the fundamental principles needed to apply these preventive measures can be thoroughly understood, and the health program in these grades is acknowledged to be inadequate.

THE INVESTIGATION—METHOD AND SOURCES OF DATA

This study* was made in an effort to throw some light on the problem of the improvement of the materials of health instruction in the high school. It seemed that some assistance might be rendered by (1) surveying the opinions of leaders in this field regarding various procedures, (2) supplementing this with a survey of what is the actual practice in the more progressive schools with respect to these points, and (3) comparing these results with the hope that possibly improvements will be indicated.

Health instruction is not given in many high schools. Some few schools have progressed much more rapidly in this field than have others. Therefore, in attempting to survey the practice in schools in which significant attempts at health instruction are made, it was first necessary to locate such schools and to obtain data from this group rather than from the rank and file of secondary schools.

A short questionnaire (No. 1) was sent to the person in each state department of education whose title indicated closest relationship to the

* Résumé of thesis submitted at the University of Minnesota in partial fulfillment of the requirement for a Master's degree.

problem of health instruction. The receiver was asked to furnish answers, or to refer the questionnaire to the person in the department best qualified to give the requested data. These respondents will be referred to as the "state group." Item I calls for the name and address of the person responsible for health instruction in each of ten schools of that state fostering an unusually good health program. From these replies a list of instructors was compiled from whom were gathered data regarding actual practices in the schools. A list of 201 instructors or school officials from 24 states was obtained from these questionnaires. Those on this list will be referred to as the "practice group."

A questionnaire (No. II) asking for data regarding the program used in the schools was sent to the "practice group" with the request that the receiver answer questions which were directly within the scope of his teaching and that in addition he supervise the collection of the remaining data from the teacher most directly involved with the course named. A copy of this questionnaire follows:

QUESTIONNAIRE NO. II AND SUMMARY OF REPLIES

Dear Sir:

I am asking your assistance in furnishing information which I intend to use as the basis of a study of health education in grades 9, 10, 11, or 12. This investigation is sponsored by the Department of Educational Administration with the cooperation of the Department of Preventive Medicine at the University of Minnesota. I hope to determine how some of the leading high schools in cities of different size are conducting their health education program. There are two copies of this short questionnaire enclosed; one to be returned to the sender and the other for your files. The results will be published and those cooperating notified of the issue, or copies will be sent for perusal. The self-addressed and stamped envelope is for your convenience in forwarding the information.

Item I. Check the type of instruction used in your school:

1. A separate course in health instruction. Taught by what department?
 2. Each subject now taught to include its portion towards health instruction.....
 3. A combination of 1 and 2.
 4. Explain any other system you are using.
-
-
-

Item II. Please list texts used in your school which develop topics in your health education program:

TEXTS

	<i>Title</i>	<i>Author</i>	<i>Publisher</i>
Separate health course
Biology
Physiology
General Science
Home Economics
Physical Education
Other courses which aid

Item III. Below is listed a group of suggested topics relating to health. Please supervise the collection of the following data. If a separate course is given for health instruction have the teacher fill in the first column. If those listed in the following columns stress any of the topics, have the teacher of that subject fill in the proper column. Use the following notations:

- (T) For a thorough and detailed treatment;
 (D) for discussion with average emphasis;
 (M) for mention but no emphasis;
 (blank) if it should not be mentioned;
 (?) if you are in doubt.

TOPICS	Separate Health Course						
	Biolog	Physiology	General Science	Home Economics	Physical Education	Other courses which may aid Theoretically what emphasis should be given	
1. The structure and function of the skeletal system	T	D	T	D	M	D	
2. The structure and function of the muscular system	T	D	T	D	M	D	
3. The structure and function of the tegumentary system	T	D	T	M	M	D	
4. The structure and function of the digestive system	T	D	T	D	D	D	
5. The structure and function of the circulatory system	T	D	T	D	M	D	
6. The structure and function of the respiratory system	T	D	T	D	M	D	
7. The structure and function of the nervous system	D	D	T	D	M	D	
8. The structure and function of the heat regulatory system	T	D	T	D	M	D	
9. The structure and function of the system of elimination	T	D	T	D	D	D	
10. The structure and function of blood and lymph	T	D	T	D	M	M	
11. The fundamentals of nutrition and dietetics	T	D	T	D	T	D	
12. The fundamentals of bacteriology	T	T	D	D	D	M	
13. Man's protective machinery	T	D	T	D	M	M	
14. Immunization and body resistance	T	D	T	D	M	M	
15. The function and need of exercise	T	D	D	D	M	T	
16. Common diseases: a) Causes	T	D	D	D	D	D	
b) Symptoms	T	D	D	M	M	M	
c) Simple treatment	T	M	D	M	M	M	
d) Preventive measures	T	M	D	M	D	D	
17. Sanitation: a) Personal	T	D	D	D	D	D	
b) Social	T	D	D	D	D	D	
18. Hygiene of: a) Fatigue	T	D	D	D	M	T	
b) Sleep and rest	T	D	D	D	M	T	
c) Clothing	T	M	D	M	D	D	
d) Bathing	T	M	D	D	D	D	
e) Ventilation and temperature regulation	T	M	D	D	D	D	
f) Special organs:							
(1) Eyes	T	M	T	M	M	D	
(2) Ears	T	M	T	M	M	D	

(3) Nose and throat.	T	M	T	M	M	D
(4) Teeth	T	D	T	D	M	D
(5) Feet	T	M	T	M	M	D
g) Posture	T	M	D	D	M	T
h) Mental	T	M	D	D	M	T
19. The reproductive system and its hygiene	T	T	T	M	M	D
20. Fundamentals of eugenics	T	T	D	M	M	M
21. Internal secretions	T	D	T	M	M	M
22. Growth as an index to health	T	D	D	M	M	D
23. Habit-forming drugs	T	D	D	M	M	M
24. Medications	T	M	D	M	M	M
25. First-aid measures	T	M	D	M	D	T
26. Prevention of accidents	T	M	D	M	D	D
27. Importance of frequent physical ex- aminations	T	M	D	D	D	T
28. Is the course elective (E) or required (R)?	†					
29. In what grade is the course given? (9, 10, 11, or 12.)						
30. Number of class hours (of.....min.) per week for course						
Add other topics which may be taught.....						
.....						
.....						
.....						

.....
 Signed
 Enrollment of School Title
 Population of City Name of School
 Address

I shall be most appreciative of your courtesy,

Sincerely,

The list of topics under item III was constructed by the author as an outline for a tentative health course. As any new topic was noted while reading, it was added to the list. A careful perusal was made through the notes collected from courses in preventive medicine for additional topics. Dr. Harl R. Douglass, Professor of Secondary Education, and Dr. Harold Diehl, Professor of Preventive Medicine and Public Health, both of the University of Minnesota, suggested a few others. There are twenty-seven of these topics, some of which have subtopics, so that there are forty-two in all. Data were requested from the teachers of the following subjects—a separate health course, biology, physiology, general science, home economics, and physical education—by filling out their respective columns with a *T* opposite each topic which is given a thorough and detailed treatment; a *D* for those discussed with average emphasis; an *M* for mention without emphasis; a blank if not mentioned; and ? if in doubt. This rating system permitted teachers, with very little writing or effort on their part, to indicate the stress given each topic.

Questionnaire No. III was constructed to discover what a group of health experts would consider the ideal program to be. The same questions were asked as in Questionnaire No. II, differing only in wording needed because of the somewhat different character of respondents. The

† Note: The letters *T*, *D*, and *M* shown here are the composite emphasis proposed by the theory group for the topic and subject indicated.

receivers of this questionnaire, the "theory group," were selected because training, experience, position held, and interest shown had proved them to be leaders in the theory and philosophy of health instruction. Many are not teaching although a great number are connected with colleges or universities in the field of preventive medicine, health service, physical education departments, and nursing service. Some are practicing physicians.

The list was obtained largely from the record of those attending the Sayville Conference of the American Child Health Association in June, 1930; the list of delegates to the National Conference on College Hygiene, 1931; those attending the eleventh annual meeting of the Student Health Association held in December, 1930; and those who aided Dr. Delbert Oberteuffer, Supervisor of Health and Physical Education, State of Ohio, Department of Education, Columbus, Ohio, with his book *Health and Physical Education*. To this list were added the names of men prominent in Phi Epsilon Kappa, national physical education fraternity; some contributors to the RESEARCH QUARTERLY of the American Physical Education Association; some authors of books or articles on health problems; and a few others known to be leaders in the education field.

After discarding a few replies which seemed to be less carefully or intelligently made or which contained incomplete recordings for rating health topics for the different courses, fifty remained in each group, and these were used for this investigation.

Replies from the teacher or practice group seemed to cover a rather broad sampling. They came from 14 different states—about one-fifth of them from the western states, one-fifth from the eastern, and three-fifths from the central district of the United States. Most of the teacher respondents are in physical education departments and this group, with superintendents or principals, composed over four-fifths of those replying. About four-fifths of them were men. About half were from schools with less than 750 pupils, and 8 from schools with over 2,500 pupils. About half were from towns with less than 20,000 population, and one-fourth were from cities with more than 100,000 population.

The replies from the theory group came from twenty-two different states, most of them in the central or eastern districts of the nation. Over three-fifths of them are employed by universities or colleges in some form of activity in the health field. Three-fifths of the replies were from men.

It is evident that a statement of a belief in the need of thorough treatment (*T*) indicates greater emphasis than does one designating discussion (*D*), and that mention (*M*) indicates even less emphasis. It is reasonable to assume that the degree of emphasis is a continuous variable ranging from great emphasis to bare mention. It seems also very probable that few of the topics should receive the greatest emphasis, few should be barely mentioned, but more would receive a treatment of an intermediate nature.

The distribution of responses—29.4 per cent *T*'s, 48 per cent *D*'s, and 22.0 per cent *M*'s—supports this theory. The distribution for the theory and practice groups taken separately was very similar. Therefore the replies were distributed in a manner similar to that indicated by the normal curve.

By assuming the normal curve a unit area, the portion of the curve represented by the *T*, *D*, and *M* per cents may be plotted under the curve. The mean deviates of each of these portions become numerical values which were employed as weights. The weights were approximately *T*—4, *D*—3, and *M*—2; and these values were used to calculate a weighted composite score for each topic as reported for each subject from replies received from each group. These composite scores may be readily used for comparative purposes. Converted into the notation of *T*, *D*, and *M*, they are inserted in the sample Questionnaire II mentioned earlier in this article. The reader should give this summary a careful inspection, as it constitutes the health experts' conception of the ideal program.

THE TRENDS OF THE REPLIES

The state officers and health experts (the theory group) were asked to rate the three most common forms of organization that are in use. Five points were awarded for a first choice, three points for a second, and one for a third, and the results showed that 40.5 per cent favored a combination consisting of a health course augmented by each subject which belonged to the health program. A health department was rated most frequently as the agency which should give health instruction. Physical education was rated second, and science third. In a majority of the schools from which replies were received no special health course was offered but a number of courses contributed to health instruction. Of those schools which gave a separate health course, the science and physical education departments led in giving the course, and only four named a health department.

The theory group very clearly indicated that a separate health course is the place to give most stress to the greatest number of topics included in the investigation and that physiology is second in point of stress. Thirty-four of the fifty respondents from the theory group were in favor of a required separate health course. The teachers furnishing data for this study placed biology as doing the most and physical education second in stressing health topics.

Only eight of the fifty schools answering give a required separate health course. Only thirteen schools reported as giving a physiology course, and in only one was it required. Therefore unless the usual content of a physiology course is given elsewhere it is not given to many pupils, in spite of the fact that a knowledge of the structure and function of the organic systems of the human body is essential for clear thinking concerning the need for most of the hygienic rules and practices. Biology was

mentioned by only thirty-four of the teacher respondents and one-half indicated that it is not required. Therefore many pupils finish high school without receiving the information in this course which leads all others in giving health instruction. The theory group prefer the health course on the average of about four times per week for a year. Most schools are giving it in the ninth grade.

PRACTICE AS COMPARED TO THEORY

A scatter diagram was constructed for each subject, using the weighted scores as reported by the theory and practice groups, to show clearly the relationship between theory and practice with respect to the emphasis for topics. By this method one may note at a glance those topics which are being stressed more and those less than the experts believe they should be. Those topics which should be stressed most and those less important for each course were also located. Space limitations do not permit reproducing this material here. The following are the most important of these findings for each course surveyed.

Special Health Course.—The structure and function of most of the organic systems receive more emphasis than the theory group believe they should receive, while mental hygiene and the reproductive system and its hygiene should be stressed more than at present. The experts would like to have considerable emphasis placed on general hygiene, prevention of accidents, first aid, and the importance of frequent physical examinations; and this is being done where this course is offered.

Biology.—Bacteriology, and the reproductive system and its hygiene, need more emphasis. The former topic is the most important for biology to stress.

Physiology.—The fundamentals of bacteriology and the function and need of exercise are being taught more extensively than the theory group indicated they should be. The structure and the function of the organic systems constitute the most important topics for a physiology course.

General Science.—Bacteriology should be stressed more. The hygiene of ventilation and temperature regulation is the most important topic for this course. Neither the theorists nor the teachers as a group seem to consider general science as of major importance in stressing health topics.

Home Economics.—One topic—namely, the fundamentals of nutrition and dietetics—stands out prominently by itself as being very important for this course to stress, while the structure and function of the organic systems, except the digestive system, are not important.

Physical Education.—Physical education should stress the function and need of exercise, hygiene of fatigue, sleep and rest, bathing, posture, and first-aid measures.

These scatter diagrams also indicate how completely each course is meeting the theory group's "ideal program." They are interpreted as follows:

In a separate health course and in courses in physiology, health material is not emphasized as much as the health experts believe it should be. Biology includes more health material than the theory group believes should be allocated there. Home economics and even physical education are not at present making great contributions, though two or three topics are given considerable emphasis in each.

THE SEPARATE HEALTH COURSE

The group of theorists who answered this questionnaire advocated clearly that a separate health course should be organized as the proper vehicle for instruction. Evidently they believe that each course contributing its share would result in "what is everybody's business is nobody's business." Many feel that such a plan requires a teacher especially trained to give such a course. Some advocate that a doctor of medicine is needed. This is obviously impractical at the present time, for only the very largest schools can afford one. Others think a trained nurse is sufficiently qualified. Since she is closely in touch with the illness in the school to which she is attached, they believe she is the logical teacher, especially if her training has included courses in educational theory. At present, the assignments of nurses often include two or more schools, leaving the nurse little time for teaching such a course. This situation could be rather easily overcome and would not be extremely expensive.

Most of the recent graduates majoring in physical education are prepared to teach a health course if guided by an efficient text, but these constitute only a small percentage of teachers now in physical education departments. Furthermore, these teachers have their course required in all grades and their program leaves little time for teaching health subjects. For these reasons this plan does not seem to be practicable, except possibly in large schools where extra teachers may be employed for this special field.

The theory group mentioned in this study suggests that physiology should supplement a separate health course. Biology is the leading subject in the giving of health information. If any school offers physiology, it may be assumed that it is usually taught by the teacher of biology. Therefore, if the biology department were assigned the separate health course, the teacher who is now doing the most to disseminate this health information would be the very one to fulfill the two most important desires of the theory group.

This study shows that what is now done in separate health courses is inadequate since only a few schools offer these courses. Health instruction in biology and physiology is likewise inadequate because so often they are offered as electives and few pupils receive the information. The universal dissemination of health information is important enough so that the course to which the major share of health instruction is allocated should be required.

The author advocates a plan which would involve the removal of the major portion of the information regarding structure, function, and hygiene of organ systems, and general health matters from the present biology course. This information with greater emphasis should be given five times a week during the ninth or tenth grade. This plan calls for a union of the separate health course, physiology, and parts of the present biology course and should constitute a *required* course for all students. The remaining information given in the present biology course in the field of botany and general zoology is very valuable and could be the nucleus for a revised course in biology, to be continued possibly as an elective, probably three times a week during the eleventh or twelfth grade.

It is to be assumed that those who would teach such a course should have had a sound professional training in teaching methods and educational theory as well as in courses in biology, physiology, and bacteriology. Virtually all who are now teaching biology have had just this type of training, and no time need to be lost in waiting for a specially trained corps to be developed.

The teacher giving this course should then be chairman of a committee on health instruction, the other members of which are teachers in other subjects contributing their share towards this instruction—the nurse, the doctor giving the health examinations and clinical aid, and the physical instructor. Any other person within the school whose interests or training are such that he can contribute to the committee should be added. In this way extensive duplication can be avoided and yet important aspects may be emphasized through repetition in one or more other subjects.

Whatever plan is adopted should involve as little change as possible within the present organization because the possibility of procuring its adoption in a majority of our school systems will thereby be much easier. It should also be given in a definite department so that all schools adopting it will be following the same procedure.

The plan here advocated meets these conditions. This plan, or some other definite and practicable one, should be universally adopted as rapidly as possible.

CONCLUSION

Leaving such an important objective in education to the piece-meal treatment of topics treated as units of various secondary school subjects cannot be regarded as satisfactory. Some important aspects of body and health are treated superficially, and some are treated several times in different courses in duplicative fashion. Because of the fact that most of the subjects in which these topics are treated are electives, few students come in contact with instruction in all of them and most students, on this account, require only a fragmentary, haphazard course in health. Therefore it seems wise and very much worth while to work for a comprehensive, balanced, and integrated health course to be placed as a *requirement* in the curriculum of our high schools.

BOOK REVIEWS

PRACTICAL BASKETBALL. Ward L. Lambert. (Athletic Journal Publishing Company, 1932) 243 pages. \$4.00.

The fast-break in basketball offense has become increasingly popular since the inclusion of the "ten-second" rule. The basketball teams of Purdue University did not have to change their system of offense radically with the introduction of this new rule, because Ward L. Lambert, coach at the Indiana school, had taught this type of offense for many seasons. The success of Purdue teams is well known to all Big Ten coaches and players; they will vouch for the efficacy of the fast-break as used by Coach Lambert and his players.

It is not surprising, then, to find an excellent description of the fast-break system in Mr. Lambert's book, *Practical Basketball*. In his opinion "The fast-break, with dependence upon the initiative of the players rather than upon set formations, is . . . the ideal system, if the coach has the necessary players." Nevertheless, other types of offense are also described in this efficiently organized book in order that the reader may judge and choose for himself the "system" which is best adapted to his own team.

The title of this book has been chosen most wisely. There are few sentences which do not include some excellent technique or suggestion for the improvement of coaching the game. *Practical Basketball* is primarily for the coach who desires an intimacy with teaching details and methods. The history of the game, conditioning, and training receive but little attention as the inclusion of such items, although interesting, needs more elaboration than would be fitting for the author's purpose.

The fundamentals of basketball including handling of the ball, offensive floorwork, goal throwing, dribbling, individual and team defense, playing situations, etc., are described most adequately, and are accompanied by the finest photographs, diagrams, and practice drills which the reviewer has seen.

Practical Basketball is a good investment for every coach and advanced student of the game of basketball.

ROSS L. ALLEN
*Washington Junior-Senior
High School,
Rochester, New York.*

ILLUSTRATED TAP RHYTHMS AND ROUTINES. Edith Ballwebber. (Clayton Summy Co.) 96 pages.

Another book by the author of *Tap Dancing, Fundamentals, and Routines*, is a valuable addition to the dance instructor's teaching material. Since tap dancing continues to maintain its popular appeal, it behooves physical educators to utilize its inherent educational values in a positive way. Miss Ballwebber's new book continues along lines projected in her earlier volume, to indicate the educational possibilities of tap dancing. In particular, the accuracy and clarity in the descriptions of "Foundation Steps" give the teacher an excellent basis for using the creative method suggested in the book, stimulating in the student a comprehending and intelligent response more worthy of college students than the passive imitation usually called forth in response to the traditional method of teaching.

The routines are arranged in a progressive series according to difficulty, with six short and seven longer dances. These vary in types covering several kinds of tap rhythms as jig, waltz, buck,

soft shoe, military, eccentric. They are original without being extreme, and of sufficient difficulty to be stimulating, and yet not daunt the student of average ability. The short ones are especially good for use in large classes which meet but once a week, where the group as a whole has difficulty in learning and remembering longer routines which cannot be taught in one or two sessions. The longer dances are good in smaller, more advanced classes, or to fill a need for entertainment numbers.

Perhaps Miss Ballwebber's most valuable contribution, as shown in both her books on tap dancing, is her analysis of musical counts, and their synchronization with the steps, making it possible for the average student to work out the steps from the printed description, without having seen them. Since timing and accent "make" tap steps, it is a relief to have these clearly defined instead of being left to innate sense as they so often are in books of this kind.

The book is generously illustrated with amusing line sketches by Harriet Ann Trinkle, which cleverly indicate positions more ably than photographs or diagrams. The music by Ellen Edwards Boyd is both apt and pleasing.

NAOMI LUBELL

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FOOTBALL PLAYS FOR BOYS. Ralph Henry Barbour and LaMar Sarra. (D. Appleton-Century Company, 1933) 111 pages. \$1.25.

This book is largely a collection of football plays for boys from twelve to seventeen years of age. It is especially designed for that group of boys who, on vacant lots, public playgrounds, or school athletic fields, engage in football with little or no supervision and without the services of an older and more experienced person as coach.

The volume opens with brief instructions on the fundamentals of football, including stances, blocking, and tackling. The introduction contains a

discussion of the safety factors that should be followed by all boys who intend to play the game. Individuals who use this book should give special attention to the first few pages where these factors are considered. This material could, possibly, have been made more valuable to uncoached players, if the authors had included a consideration of drills that could be used by the players in learning fundamental skills and in conditioning themselves to withstand the rigors of the sport.

The bulk of the book is concerned with setting forth lucidly and in full a number of simple and practical plays that are up-to-date and suited to junior teams. Six fundamental formations in the construction of plays are used. They are: the "T," the Notre Dame, the Warner Single and Double Wing-Backs, the Short Punt, and the Punt. Typical examples of these formations are diagrammed, and a series of plays from each formation is given. Each play is accompanied by a graphic diagram and a complete explanation of the part each player takes in it.

The final pages of this book deal with touch football. Due to the increasing popularity of this game as a fall intramural and recreational activity, this inclusion is particularly appropriate. The game outlined retains many of the essential features of football, while doing away with the dangers associated with blocking and tackling. It is of the non-contact type, with blocking, both on the line and in the open, completely eliminated. Considerable freedom is allowed in the use of the forward pass, although only one pass, which must be thrown from one yard behind the line of scrimmage, may be made on one down. The offensive team is allowed four downs in which to advance the ball twenty yards. A number of touch football plays are diagrammed and described. They are variously known by such names as the "Strawberry" Spread, the "Rocket" Pass, and the "Zipper" Play.

That the possibility of injury looms large for those boys playing football in

unsupervised groups is clearly evidenced from recent researches on injuries in football. A book, calling attention to the dangers of football and to the precautions to be taken to avoid injury, that is within the price range of the average boy, deserves a place in the literature relating to athletics.

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York*

FUNDAMENTALS OF RHYTHM AND DANCE. Betty Lynd Thompson. (A. S. Barnes Co., 1933) 230 pages. \$3.60.

An ambitious title such as that chosen for this book implies an exhaustive treatment of the subject at hand. Upon perusal one undoubtedly finds that such an accomplishment has been attempted, with success only in breadth, not in depth of subject matter. The material varies from descriptions of rhythmic exercises to detailed plans for a public performance; from written tests for classes in clog and tap to descriptions of lyric and dramatic dances. In justice to Miss Thompson it must be said that she has departed somewhat from the accepted formula of most books on dance from the physical education field, and devoted a comparatively small number of pages to notations for dance studies and dramas. She has rather displayed an amazing industry in the transcription of test material, lesson plans, and rhythmic analyses of traditional dance steps and clog and tap routines.

From the standpoint of creative dance, one must point out a certain misconception of the nature of the dance experience. While it is true that emotional feeling will naturally be inherent in most of the finest dance compositions, the impression given in these pages is that the expression of individual emotions ("moods" would seem to be the more exact term) represents the heights of dance as an art form. Again, dance is no longer considered to be a vehicle for the interpretation of music, although that is another doubtful vir-

tue which is ascribed to it in these pages. During the romantic period, it is true, the slogan of dance was "express yourself," and the following excerpt from the introduction would place the author among those who still cling to that approach to creative dance: "The easiest emotion to express is joy; later, she (the student) will try some of the harder ones, and finally her dancing will be a true expression of her personality and character." It is unfortunate that much of the material should have been built upon such an undeniably unsound premise.

It would appear that one can create only when one has acquired a trained instrument of expression, to judge by the prescription for beginning classes, which consists principally of rhythmic exercises to music. Does not such a procedure violate those progressive educational principles which hold that technique should be presented after the need for it is appreciated? Surely one is creating just as surely when, in exploring movement, one builds into simple form the product of that exploration, as when a finished dance composition is being made.

The most noteworthy chapters in the book are those concerned with fundamentals of rhythm. Here characteristics of rhythmic patterns and their familiar forms are analyzed in great detail, and progressions from simple to more complex are set forth graphically and with abundant use of illustrative symbols. It would seem to this reviewer, however, that a rhythmic vocabulary in terms of "long, long, short, short" is an unnecessary hurdle to clear in an understanding of the rhythmic structure. Musicians for ages have used note symbols satisfactorily to express time duration in rhythmic patterns. The invention of another set of symbols is of questionable value, particularly as they are less accurate and, considering the musical knowledge supposedly obtained in our schools today, hardly any easier to use. To the student of dance some technical knowledge is desirable in any event, and the ultimate translation of

any set of rhythmic symbols into musical terms would be necessary. It must be said that certain shortcomings in the realm of music are displayed in this book. The choice of music for technique and dance composition is inadequate, and limited almost entirely to composers of the romantic period. Also, Miss Thompson has chosen, in certain of her dance descriptions, to omit entirely portions of the music, a practice which has caused dance to fall into great disrepute with musicians.

In spite of its faults, there are parts of this book, which the teacher of dance will find distinctly helpful. Notably, these are the rhythmic analyses of dance steps, the chapters on clog and tap dancing, and the sources of material and phonograph records for folk dance. These parts are comprehensive and carefully compiled, and may be considered a definite contribution.

RUTH L. MURRAY

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EDUCATION THROUGH PHYSICAL EDUCATION: ITS ORGANIZATION AND ADMINISTRATION FOR GIRLS AND WOMEN. Agnes R. Wayman, A.B., M.A. Third Edition. (Lea and Febiger, 1934) 378 pages. \$4.00.

This third edition of Miss Wayman's eminently successful book is a complete exposition of the administration of physical education for girls and women written from a woman's point of view. It would not readily appear that this is the only point of view although the very obviousness of the situation indicates that it is a significant way to view the problem.

Miss Wayman as a leader of the Women's Division of the N.A.A.F. has given a vivid and forceful expression to the hope of many women that girls' athletics shall not reproduce the absurdities of the professional programs that so often characterize the activities of boys. This same leadership is shown in her book and very ably defended.

The publishers have erred several times in paging the sections in the Table of Contents, but minor mistakes of this kind do not seriously detract from the book. The profession is grateful for Miss Wayman's purpose to keep the book up-to-date.

JESSE FEIRING WILLIAMS

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INDUSTRIAL HEALTH SERVICE. Leverett Dale Bristol, M.D., Dr.P.H. (Lea and Febiger, 1933) 170 pages. \$2.00.

It is interesting to note in this special phase of public health, i.e., industrial health service, the general trend of the larger field. Sanitation of environment in an industrial health program is still of major importance, but it has been supplemented by health education for the individual worker to such an extent that the latter is now dominant. Publicity to improve the wholesomeness of personal living, the periodic medical examination, the desire to gain an effective, really intimate, rapport between the private physician and the industrial worker, attention to the correction of defects in the individual—all of these efforts to better the health of the individual are recognized by Dr. Bristol as elements of any program of industrial health service.

Industrial Health Service describes briefly and practically an adaptable plan for a health program in large and small industrial organizations. The author has wasted little space with philosophy, trends, etc.; he has given what he considers a practical plan for industrial health service. There is no evidence of "padding"—he has written clearly and effectively from excellent experience. His approach to the subject includes three phases: industrial health service from the standpoint of management, from the standpoint of the supervisor, and from the standpoint of the individual worker. Any workable plan for industrial health service must depend on the cooperation of all the personnel to be affected. Dr. Bristol has been able to gain the cooperation of the

personnel through a creditable organization and administration of the health service. It is apparently his belief that a staff of professional people in public health will not insure an effective industrial health service without every industrial administrator, supervisor, and worker having an active part in the program.

One readily sees that the industrial health service is clearly limited in its scope. Dr. Bristol recognizes its limitations: there will be no misunderstanding with or encroaching upon the work of the private physician; no inroads will be made into the field of curative medicine; industrial health service is fundamentally a health promotional activity.

Industrial Health Service should be of particular value to students in this field, and to experienced workers in industrial hygiene who have been seeking a guide for a well-rounded program in industrial health service.

ROSS L. ALLEN

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HEALTH WORKBOOK — FOR COLLEGE FRESHMEN. Kathleen Wilkinson Wooten. (A. S. Barnes & Co., 1934) 214 pages. \$1.50.

This is a health workbook for college freshmen in an orientation course in personal, home, and community hygiene. It is constructed upon the philosophy that such a course must be fundamentally an activity program, and that the student must be taught to think in terms of adjusting herself to the personal, family, and community health problems.

From this point of view the book is very practically written, and shows careful checking and experimentation in the practical problem of teaching such a course to college freshmen. It shows careful selection of subject matter and essential material for a time allotment of about three semester hours of college work. The construction, however, gives it a great amount of elasticity and adaptability so that it could

be used very profitably in a course with a longer or shorter time allotment.

The book begins with an introduction to the teacher and to the student in which the author establishes her philosophy of health education and teaching methods. This contains numerous references and a complete bibliography.

The book proper is divided into forty-seven chapters. Each chapter represents material for an hour's assignment, or more if time would permit of a more exhaustive study. Each of the chapters gives (1) the objectives of the lesson, (2) the study outline, (3) directions for the activities, (4) the references. At the close of the chapter are blank spaces for class notes, blanks, charts, illustrations, and other helps for the activities.

The objectives are clear and well stated. The study outlines are explicit and definite. The activities are practical and should stimulate the interest of the student. The references are well chosen and clearly keyed to the material in the study outline.

The book is well bound in paper cover and durable if the teacher desires to leave it intact. It is also perforated so that it can be used in loose-leaf form if desired for the inclusion of additional material or to have the assignments passed in at the close of each recitation.

This workbook is a very valuable contribution to the field of college hygiene teaching. It will prove most helpful to the teacher who is charged with the responsibility of teaching such a course to college freshmen, as it represents that which can be obtained only by many years of experience in teaching college freshmen with a willingness to devote one's self to constant experimentation and a careful checking of results.

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THE NEW LEISURE CHALLENGES THE SCHOOLS. Eugene T. Lies. (National Recreation Association, 1933) 326 pages. Paper \$1.50. Cloth \$2.00.

The New Leisure Challenges the Schools raises many questions and chal-

lenges which face the administrators of the progressive schools. These questions and challenges, either directly stated or implied, emphasize the part education must play in the drama of future leisure and command the cognizance and co-operation of the communities which they serve.

Questions to Be Answered

1. How much of a problem is this leisure for our schools?
2. What are the contributions of the academic program?
3. Are there contributions from the creative activities and exploratory experiences?
4. Do the courses in fine and applied arts contribute to adult activities?
5. Does the vocational and avocational guidance now offered contribute to leisure-time values?
6. Is there recreational leisure-time guidance in the public school library and is the school library open to adults in communities without public libraries?
7. Is the physical education program designed to prepare for adult leisure and recreation and does it prepare students to direct their own activities?
8. Is the school club a part of the activity program and does it train for adult leisure?
9. Is scouting or are scouting type activities found in the school?
10. Does the school serve as a social center for leisure-time interests and activity?

Challenges to Be Met

1. The school, a community center.
2. Recreation, a school challenge.
3. Leadership, a school opportunity.
4. Adult education, a community obligation.
5. Cooperation, a community welfare need.
6. Crime and delinquency, a leisure and education problem.
7. The lighted school house, a human savior.
8. All leisure time, a school responsibility.
9. Social training, an activity value.

10. Physical education teachers, year-round recreation leaders.

The author is not only aware of the problems involved in answering the questions and meeting the challenges but recognizes the opportunities which he develops to a ratio of ten to one. He realizes the phlegmatic response given in the past in preparing for this leisure and the indifference expressed in meeting it now that it is upon us. The solution is not insurmountable but quite simple for those who have a vision beyond the horizon. His training, experience, surveys, and contacts assure one that the solution of the problem is based upon the place of the school in relation to other factors involved, including the interlocked co-operation of all community agencies and establishing a new viewpoint, a change from an exercise to a socialized program.

The ultimate challenge rests with the teacher-training institutions which must change their viewpoint, technique, and method from basic factual instruction to avocation, creation, and spiritual appreciation, and the solution rests with the community, all agencies contributing to the leisure problem.

The school is responsible for all that grows out of its courses and activities and must take the initiative. Other community agencies must direct their specialties, coming to the school for supplementary aid. The school alone cannot fully meet the challenge.

There is a comprehensive interpretation and a practical guide to the new leisure before us which takes us into the avocational field and presents opportunities to cultivate latent talents into the spiritual field of creation and recreation.

LOUIS KULCINSKI
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BETTER CITIZENSHIP FOR LITTLE AMERICANS. Edith Wilhelmina Lawson. (Beckley-Cardy Co., 1933) 176 pages.

Better Citizenship for Little Americans, a book written for grades two and

three, is a series of stories about children who developed citizenship qualities through careful use of money, time, and materials.

The book is pleasing in appearance, the illustrations are attractive, and type and paper are suited to the needs of children.

Many of the stories tell of the undesirable habits of certain children and attempt to show how, through punishment, external reward, opinion of teachers and playmates, or through some such magical means as a dream, these young citizens changed their ways of living.

One child is fined five cents for tearing a book, another for soiling a book, a boy is paid by his mother two cents for each day he comes home from school with clean clothes, children are given red stars for having neat papers, others because they read well are rewarded by finding pennies, lumps of sugar, or pictures in their books. Because of a dream a little girl changes from being careless and indifferent in all ways to "a careful orderly little girl that every one loves."

Educational philosophy is today based upon the belief that learning takes place through doing, that education is a process of experiencing, a way of living. It is believed that behavior to function in the child's life must result from his own purposing and planning and that satisfaction in his way of living will be his reward. Experiences in home, school, and community all contribute to his way of living.

If we accept this philosophy, can we expect children to develop citizenship qualities by reading about them? Can we expect external rewards and punishments planned and administered by adults to change a child's way of living? Can we expect a child to overcome suddenly a bad habit which his parents or teachers have allowed to develop over a long period of time?

Must we not as teachers and parents guide children in the discovery and solution of real problems of behavior as they arise in every day living? Should not stories written for children portray

the purposing, planning, and satisfaction of the children themselves as they discover, attack, and solve problems involved in becoming better citizens?

ETHEL ROCKWELL

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THE STATE AND HIGHER EDUCATION— PHASES OF THEIR RELATIONSHIP.

Edited by Fred J. Kelly and John H. McNeely. Sponsored by The Carnegie Foundation for the Advancement of Teaching in cooperation with The U. S. Office of Education, Department of Interior. (Carnegie Foundation for the Advancement of Teaching, 1933) 272 pages.

Like other agencies, educational institutions, both public and private, are feeling very keenly the effects of financial depression. It is a fact that while financial resources are being greatly curtailed in most institutions, increased educational service is being demanded of them. The results of this "purification by fire" has led many states to seriously evaluate the educational services offered within their borders.

Some of the questions to which financial stringency is forcing answers are:

How far is unwarranted duplication of course offerings taking place in the state when both public and private institutions are considered?

How far has overexpansion taken institutions beyond their power to maintain such services?

How can a given state so coordinate its programs that the aggregate will constitute a unified system of state higher education?

How can the state insure that the quality of education in any given institution chartered by the state is good when the number of inadequately supported private institutions is so large?

To stimulate a search for adequate answers to these questions and to relate the experiences of some states in their respective searches, the Carnegie Foundation for the Advancement of Teaching

joined forces with the U. S. Office of Education in the preparation of this bulletin.

The contents of the bulletin can be briefly summarized by reference to the three main parts of which it consists.

Part I deals with the control and curricular offerings of institutions of higher education in ten selected states (Colorado, Indiana, Kansas, Michigan, Oklahoma, South Carolina, South Dakota, Texas, Virginia, and Washington) which would exemplify a variety of practices. The status of higher education is here described "as disclosed by the number, types and location of institutions, methods of their control, and their curricular offerings."

It would seem that no institution in the states mentioned would aspire to embark on new educational ventures without carefully considering this part of the bulletin.

Part II deals with the trend toward unified control. The inefficient results of the multiplicity of governing boards in each state are indicated. In the past it seems that "institutional growth and institutional prestige were the primary considerations, rather than the dovetailing of the programs of all institutions into the most effective scheme of providing a complete but economical system of higher education in the state."

It is evident from this study that the proper coordination of private and public institutions in any state is most desirable under any new plan for economy and efficiency.

Part III deals with significant variations by states in their methods of control of higher education. The purpose here is to present basic data that may be used to answer many of the questions raised in the beginning of this review. In this part are likewise included a limited number of state tables derived from basic data. Some of these deal with population, resources, financial receipts of higher institutions, enrollments, migration of students, support, etc.

This important bulletin should be a guiding light not only to all adminis-

trators of higher education who have been groping in the dark but also to those whose political or community zeal have made unjustifiable demands upon the financial resources of the state. The volume should be particularly thought-provoking to administrators of teacher-training institutions.

CHARLES C. COWELL

The Ohio State University

HOW TO TEACH SWIMMING AND DIVING, Volume I. Thomas K. Cureton Jr., B.S., B.P.E., M.P.E. (Association Press, 1934) 256 pages. \$3.00.

"The material in this book is arranged for the teacher and is as scientific as ten years of study and research permit it to be." With these words contained in his preface Mr. Cureton proceeds to carry out very conclusively the task he set for himself of applying a scientific attitude to the sport of swimming. Throughout, the author has kept in mind the teacher as he or she faces problems centered about the teaching of swimming and diving. The tools of science have been trained upon swimming to show how it adds to the education of the individual, and the author explains how physics, psychology, sociology, physiology, and hygiene may contribute directly to the solving of problems involved in the teaching situation.

Particularly has Mr. Cureton stressed the philosophical basis of learning and the elements of pedagogy as they should apply to the teaching process. Many teachers have felt that these very definitely help swimming to "contribute to habits, ideals, attitudes, and skills which fit into the general scheme of education for life" but it is good to see in writing the conclusive evidence. If swimming does rank number one as a body builder and as a sport which may be enjoyed throughout life, as Mr. Cureton indicates, why should not we as educators utilize its possibilities for health, physical development, skill, and even character education to the utmost as this book suggests? The chapters on philosophy and elements of pedagogy

are filled with much clear thought and invaluable suggestions for every teacher.

Chapter titles are included here to indicate the breadth of Mr. Cureton's treatment of his subjects:

I. Philosophical Basis of Instruction; II. Elements of Pedagogy Applied to Swimming and Diving; III. Control of the Health and Supervisory Relationships in Swimming and Diving; IV. Historical Development of the Swimming Strokes and a Survey of the Literature; V. Historical Development of the Teaching Methods; VI. Aims and Objectives on the Beginner's Level; VII. A Comparison of the Best Known Methods for Teaching Beginners; VIII. Studies in the Analysis of the Beginner's Skills, A Natural Teaching Sequence; IX. The Rotational-Testing Method of Teaching Beginners—Lesson Plans; X. How to Teach Confidence and Adjustment to the Water; XI. How to Teach Breathing and Buoyancy; XII. Initial Safety and Control of Body Position; XIII. Initial Diving; XIV. How to Teach the Leg Kick; XV. The Arm Movements; XVI. Coordination.

I believe this book is worthy of a place in the library of every coach, instructor, and student of swimming who has a progressive attitude towards the broadening aspect of physical education.

IVAN C. SMITH

South Chicago Y.M.C.A.

PROGRAMS FOR PARENTS. (Revised Edition). Nell Boyd Taylor. (Department of Child Welfare and Parent Education, State Teachers College, St. Cloud, Minn., 1933) 48 pages. 25 cents.

This pamphlet might well be termed a "Course of Study for Parent-Teacher Groups." Such chapter headings as the following point out the nature of the content material: "Importance of the Early Years of Childhood," "Constructive Discipline in the Home," "Training the Child's Emotions," "The Play Life of Children," and "Family Relationships." Each chapter is developed along

the same general plan which may be divided into four major parts as listed below.

Part One.—"Suggested Observations and Records of Child Behavior." The reader is asked to observe carefully certain phases of a child's behavior and to record the results of his observations.

Part Two.—A detailed outline of the general subject under discussion is next presented. For example, in the chapter on "The Play Life of Children," the outline deals with the many different angles of play—objectives, aims, types of material and equipment, commercial amusements, and others.

Part Three.—Parent Problems for Group Discussion. Three or four problems dealing with specific cases and all relating to the general subject are presented. These problems are extremely interesting, common, and in most cases, difficult of solution. Just one of them would be sufficient to stimulate a lively discussion and an interminably long one without possibly arriving at any conclusion were it not for:

Part Four.—References. A very complete reference list including both books and pamphlets ends each chapter. The chapters or pages bearing upon the particular subject under discussion are also given thus eliminating a great amount of wasted effort that would result if the reader were forced to hunt through the entire book for the information sought.

It would seem that this pamphlet, if correctly used, would be a valuable asset to any parent-teacher association. It might well serve as the focal point for group study over a period of a year. The reviewer has had the pleasure (and at times the pain) of attending numerous association meetings some of which seemed to have no guiding thought or purpose. This pamphlet serves to steer the group safely past the Scylla of aimlessness and the Charybdis of ignorance.

H. DANFORD

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